Annex IV
NON TEHNICAL SUMMARIES

MUNICIPAL SERVICES PROJECT - CONSULTING SERVICES FOR
BRAILA, VRANCEA, ILFOV, IALOMITA AND CONSTANTA COUNTIES

ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

„REHABILITATION AND MODERNIZATION OF WATER AND WASTEWATER SUPPLY SYSTEM IN CONSTANTA –IALOMITA REGION"

NON-TECHNICAL SUMMARY
CONSTANTA AGGLOMERATION

Evaluators of the Environmental Impact Assessment Study Report:

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CONTENT

1. PROJECT DESCRIPTION

The purpose of this investment is to rehabilitate and modernise the sewerage network, as well as the Wastewater Treatment Plant in Constanta agglomeration.

In accordance with the Town-planning Permit no. 89/20.02.2009, the construction site is located in the administrative area of Constanta City.

The site is public domain of local interest administrated by territorial administrative units, public domain of the county administrated by Constanta County Council and state public domain under the administration of NA Romanian Waters (Apele Romane) – DADL.

The foreseen works are located in Constanta City, including Mamaia resort and Palazu Mare.

The county administrative territory is crossed by DN2A, DN3, DN39 national roads and by the European Road E60.

1.1. Project site location

The locality has the following neighbours:

- in the West part Valu lui Traian locality
- in the East part, Black Sea coastline
- in the South-West and South Cumpăna locality and Lazu and Agigea localities
- in the North part, with Mamaia Village, Siutghiol Lake

Fig.1 Works location

The project includes the following works:

- Optimising the technologic flux from Palas Water Treatment Plant– Constanta
- Introducing a tertiary stage at Constanta South WWTP
- Works to reduce odours at Constanta North WWTP
- Resizing and extension of water supply distribution network and domestic sewerage network in Constanta agglomeration
- Setting up a wastewater Pumping stations

Optimising the technological flux from Palas Water Treatment Plant– Constanta

Palas Constanta Water Treatment Plant has the source in Navodari Poarta Alba Channel, with a water catchment located near Galesu locality. Here is also a Chlorination Station that accomplishes a pre-chlorination of the raw water, before pumping it to Palas.

Through Danube – Black Sea Channel water runs slow because of the sluice gates in such manner that the Channel works like a huge settlement tank with intermittent functioning, with two consequences:

- suspensions are reduced massive, the cached water being with a variable turbidity between 1.6 and 5.5 degrees;
- the appearance of taste and odour characteristic for the swamp water.

These new elements, supplied by the treatment plant operation, imposed a modification of the present operational technological scheme, as:

- renouncing to the existing suspensional settlements tanks, that have no objective anymore cause of the massive suspensions reduction;
- introducing into the scheme some granular activated coal, as finishing stage, having as main objective the improving of the water organoleptical qualities.

Introducing a tertiary stage at Constanta South WWTP

Constanta agglomeration represents a tourism area, by maximum importance which needs special hygiene conditions for sand and sea water used for bathing, even in discharging areas in Black Sea of wastewaters after their treatment.

The existing Constanta South WWTP includes mechanical stage, biological and sludge treatment stage.

It is necessary to upgrade the Wastewater treatment plant to ensure the tertiary treatment, in order to follow the admitted limits for wastewater discharges into the natural body waters, according to NTPA 001/2005.

By introducing the tertiary stage will be fulfil the following:

- Assumed environmental commitments by Romania through **ACCESSION TREATY TO THE EUROPEAN UNION,** chapter 22 – Environment Protection.
- Staging Program included into the **WATER MANAGEMENT AUTHORISATION** no. 221/November 2008.

Maintaining the current situation will lead to environment deterioration by infiltrations and uncontrolled discharging. The solution to maintain the current situation can't be accepted for a balanced development of the area because by setting up a public infrastructure it is considered necessary to rehabilitate and modernise the sewerage, as well as to introduce tertiary treatment at Constanta South WWTP.

In case of maintaining the current situation there won't be any financial effort but the population comfort level and the environmental conditions are improper for an area that suffers a continuous development.

Works to reduce odours at Constanta North WWTP

During the summer season period (6 months/year) the sludge generated in Constanta North WWTP will be transported, by pumping, to a special location created by the Regional Operator situated at a distance of 5.5 km from Constanta municipality, area in the property of S.C. RAJA S.A. Constanta.

On this location it will be built two basins for static sludge thickening, two tampon basins, a hall for thickening and mechanical dehydrating of sludge and also a dehydrating sludge storage system.

Also, for Constanta North WWTP was foreseen a station for odour reducing, odour resulted from the wastewater technological treatment processes.

Site organisation will use the existing locations or mobile caravans for technical personnel and for stock storage.

In order to characterize the waste for the Project **„Rehabilitation and modernization of water and wastewater supply system in Constanta County–Constanta agglomeration"** it is necessary one analyse of these as well for the execution period and for the operation period.

The waste resulted from the investment *execution* activity are represented by:

- Domestic waste
- Technological waste and construction waste
- Connected activities waste

A part of the generated waste from the execution period will be recycled.

The waste resulted from the Wastewater Treatment Plant *operation* activity, are represented by:

- domestic waste
- solid waste retained by grids and sieves
- sludge from the municipal Wastewater treatment (treatment sludge in case that were stored inside the Wastewater Treatment Plant or existing in different channels, tanks, pipes in rehabilitation)
- waste resulted from sand separator
- solid wastes retained on grates and screen

2. ENVIRONMENTAL IMPACT ASSESSMENT

2.1. Environmental factor WATER

Constanta county territory is part of two distinct structural, geological and hydro geological separated by a big tectonically fault named „ Capidava – Ovidiu overthrust line", named after the two localities located at the extreme points:

- north unit of Central Dobrogea
- south unit of South Dobrogea

In the vicinity of the proposed investments are: Siutghiol Lake, Black Sea and the Romanian

Coastline of the Black Sea.

Siutghiol Lake is situated in the north margin of Constanta City and is formed by blocking a river bed and from genetically point of view, a river-marine retreat.

The lake has 7,5 km length and 2,5 km width and a calcareous island, Ovidiu, with a surface of 2 hectares.

The lake, with the total surface of 2023 hectares represents the most important place for birds populations in the nestle period, for migration species and for the species that spend the winter in our country.

Black Sea is the third sea as surface in Europe, after the Mediterranean Sea and North Sea. It is also, the most isolated sea from the planetary ocean – the only connection with the rest of World Ocean, through Mediterranean Sea, being Bosfor – Dardanele, Gibraltar Narrows and with Azov Sea in the north-east, through Kerch Narrow.

The water surface of marine water (until 150 m) sustains the only inhabitants of Black Sea ecosystem.

- The expanse of surface water: 432.000 km^2
- The water volume: 2.212 m
- Salinity: 18- 22%
- Biological species
  - Algae, plants: 1.619
  - Invertebrates: 1.983
  - Fish: 168
  - Martine mammiferous: 4

Romanian seaside

The length of Romanian seaside is 244 km (from the total 4340 km), representing 7,65% from the frontier length. The seaside is divided in two principal sectors: north and south.

Constanta agglomeration is in the south sector of Romanian seaside (80 kilometres) and it is located between Cape Midia and Vama Veche, being covered by calcareous cliffs by different hights, between 3 and 3.5 m, short sandy beaches sectors at the rivers limits and in ports (Midia, Constanta, Mangalia).

2.1.1. Water pollution sources and pollutions emissions

- **Execution Period**

In the proposed Objective Execution Period the main sources of water pollution are represented by the construction site organization, the equipment and transportation vehicles traffic, works for setting up the investment.

The impact upon the water environmental component in the execution period of the investment is **insignificant and temporary**.

- **Operating Period**

In the investment Operating Period the pollution sources are the following:

- untreated or insufficient treated Wastewater discharged into the recipient body water;

- petroleum products losses from vehicles that serves the sewerage or auto ways that are in transit;
- losses, in case of damage, from the technological water line and sludge line from the Wastewater Treatment Plant;
- accidental pollution caused by loosing the impermeability or defect tanks or sewerage channels connection or defection at the Wastewater Treatment Plant;
- water contamination caused by improper conditions for storage of chemical substances used for water treatment , as well as not to observe hygiene and cleaning conditions;

In case if the technological flux is carefully and strictly followed, the investment won't produce pollutions to affect the environmental factors: soil, surface and underground waters, the impact being appreciated as **insignificant.**

2.1.2. Water protection measures

➢ **Execution Period**

To prevent and to control the water pollution in the construction period we are recommending the following measures:

- to avoid discharging into the emissary of waters with a high level of solid suspensions, caused by the construction activity, without a pre settlement of those ones.
- sludge produced by emptying any tank, channel or other existing source will be stored and evacuated in accordance with the present legislation regarding sludge management
- water catchments for constructive necessities will be accomplished only based on issued authorisations by competent authorities
- proper maintenance of utilised machineries to perform the foreseen works in the Project and storage in the foreseen conditions from the present legislation of construction materials and consumables
- any storage tank of combustibles or fuels will be carefully impermeabilizated, supervised and located on a concreted platform, designed with gutters.
- it is forbidden to use asbestos to the executed constructions.
- will be set up sewerage systems, treatment and discharging of storm water that are washing the platform of construction organization site.
- fuels and waste greases will be turned to specialised units

➢ **Operating Period**

For water protection in the Wastewater Treatment Plant functioning stage it is necessary to follow the measures:

- insurance of proper maintenance for the Wastewater Treatment Plant
- monitoring water quality at the entrance and at the exit of the Wastewater Treatment Plant and applying measures to decontaminate them before discharging
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals; these will be manipulated by trained personnel, in order to avoid water contamination with such substances measures will be taken
- an Intervention Plan in case of accident will be elaborated
- training the personnel about work conditions and maintaining a high level for hygiene and cleaning standard
- insurance of a strict management for installations functioning , as well for the

Wastewater flow, that could affect the discharged water quality;
- periodic control of the installations and checking of the impermeability, operative defections remediation
- technical state and inside sewerage network functioning control

2.2. Environmental factor AIR

When defining the climatic characteristics of the area there must be taken into account that the area is a contact area of water-dry land where three life environments are overlapping: water, dry land and air that are in a continuous movement, in the context of a temperate continental climate, where is located Black Sea, base for the influences mentioned earlier.

2.2.1. Generated sources and pollutants

➢ **Execution Period**

The investment Execution Period from Constanta agglomeration is characterised by the following pollution sources:

- powder and dust generated be the investment's rehabilitation and modernization works. Emission of these pollutants will be limited in time for this site. Works will be executed on sections that are scheduled successive depending on the execution chart and the rhythm to finalize works.
- machinery and equipments by their functioning in the working fronts area. Machinery and equipments specific activity pollution is appreciated depending on fuel consume that are generating pollutants like: NOx, SOx, CO, COV_{nm}, aldehydes, hydrocarbons , organic acids, suspension and sedimentables particles
- the traffic to accomplish the investment, traffic specific pollution is appreciate upon fuel consume that generates pollutants as: NOx, CO, COV_{nm}, suspension and sedimentables particles.
- improper maintenance of machinery and equipments
- dust generated by the machinery and equipments traffic and construction materials manipulations
- unpleasant odours generated by the existing sludge evacuation from tank, channel or other existing source, under rehabilitation works
- improper storage conditions for combustibles utilised to accomplish the construction works

➢ **Operating Period**

During the investment rehabilitation and modernization works it is appreciate those sources of air pollution stops.

2.2.2. Impact on air

➢ **In Execution Period**

The performed works during the objective execution period have a reduced impact upon the working and neighbourhood area atmosphere quality.

Works for construction site organization will be elaborated and executed correctly, with modern endowments to reduce the emission of noxes in the air, water and on soil. Grouping these into a single site is good by decreasing the impact areas and promotes a controlled and correct operation.

➢ **In Operating Period**

The entire dewatering process is performed mechanically being automatic. During the treatment technologic process there aren't produced any gaseous noxes or odours.

Through the adopted technology, the domestic residual waters and sludge resulted are continuous treated being excluded from the anaerobe fermentation area with noxes production as: sulphured hydrogen, methane, carbon dioxide.

The gross retains from the raw water from the automated grids will be transported periodically and are not producers of bad odours.

The sludge is stabilised by aeration and dewatered mechanically through a performant automatic mechanical procedure.

2.2.3. Impact decreasing measures

➢ **During the Execution Period**

For air protection during the construction period were proposed the following measures:

- Performing section works, in accordance with execution charts; correlation of works site machinery working charts with those from the production bases.
- Minimising dust and suspension powder emissions resulted from execution works, pipes replacing etc. by applying technologies that are leading to fulfil the demands of STAS 12574-87 regarding atmosphere protection
- Technological machinery will fulfil the requests of GD no. 743/2002 regarding the establishment of approving type procedures of internal combustion motors, intended for mobile off-road machinery and establishing limits for gas and pollutant particles emissions from these
- Performing periodical technical inspections of construction machinery.
- Maintenance and service for machinery and vehicles utilised to reduce the atmosphere pollutants
- The fuel supply of transportation vehicles will be done only in fuel distribution centres.
- Setting up special platforms for materials, machinery and waste storage
- Activities that are producing a lot of dust will be reduced during strong wind periods, or will be done a surface moistening
- Periodical verification of machinery and transportation vehicles regarding the carbon monoxide emission level and others exhaust gases and commissioning only after repairing the possible defections.

➢ **During the Operating Period**

For air protection during the operation period were proposed the following measures:

- sewerage and water supply systems, as well as Wastewater Treatment Plant proper operation and maintenance,
- reducing the energy consumption
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals and only by specialised in this field personnel
- the storage of possible inflammable or explosive substances will be done only strictly following the present legislation

2.3. Environmental factor SOIL

2.3.1. Soil and underground pollution sources

➢ **During the Execution Period**

During the execution period the potential pollution sources of soil and underground could be:

- traffic of utilised vehicles and heavy machinery generates pollutants from burning combustibles, as well as from machinery functioning into the working fronts, pollutants that trough the dispersion environments, especially by layering air pollutants, may be settled on soil and structural pipes of the soil profile.
- accidental fuel, greases, cement, chemical substances or pollutant materials loses during the manipulation and storage;
- improper maintenance and technical defects of machinery, fuel supply, equipment repairing, accidents that may generate combustibles and grease leakages that can lay on soil, leading to structural alteration of soil.
- waste resulted in technological processes and the domestic waste can settle and pollute the soil
- uncontrolled storage and on unarranged spaces of fuels and greases as well as other materials necessary for works execution;
- improper storage of the sludge resulted from the rehabilitation and modernization of the Wastewater Treatment Plant
- sagging soils by heavy construction machinery through the material storage landfills
- taking out of the usual utilisation terrains in order to accomplish the construction site organisation
- the excavations executed for the new boreholes or to replace or set up new pipes
- untreated or partially treated Wastewater exfiltrations into soil or underground, caused by replacing pipes works
- untreated wastewater discharges on soil or infiltrations into the phreatic layer during the rehabilitation of the Wastewater Treatment Plant

➢ **During the Operating Period**

During the operation period the potential sources of pollution for soil and underground are represented by:

- defaults caused by clogged pipes or caused by accidental fissures.
- improper functioning of the Wastewater Treatment Plant can lead to soil pollution.
- untreated or insufficient treated Wastewater discharged on soil
- untreated or partially treated Wastewater exfiltrations into soil or underground
- uncontrolled utilisation of sludge on agricultural lands, in the case when this one does not fulfil regarding the quantity, or isn’t applied in the proper quantities according to the present legislation
- storage in improper conditions of chemical substances utilised for water treatment.
- improper storage of technological wastes resulted from the activity of operation and maintenance of the Wastewater Treatment Plant

2.3.2. Impact on soil and underground

➢ **During the Execution Period**

During this period of time appears a physical impact on soil by performing specific works of the Investment. In accordance, the impact signifies the followings:

- temporary utilizations of fields for construction site organization, technological roads

and degrading soils quality

- combustibles losses, greases on soil surface resulted from the parking spaces, fuels supply pumps, accidents could affect significant the soil quality
- technological waste, waste resulted from traffic stored improper on soil surface that can alter the soil quality

➢ **During the Operating Period**

Soil pollution can appear as a consequence of improper storage of technological waste resulted from the activity of operation and maintenance of water supply and sewerage system and also of the Wastewater Treatment Plant.

Improper functioning of water supply and sewerage system and also of the Wastewater Treatment Plant can lead to soil pollution.

The Wastewater transportation pipes cracking can lead to soil and underground water pollution.

2.3.3. Soil and underground protection measurements

➢ **During the Execution Period**

In order to avoid the water and underground pollution, during the execution period are to be performed verifications and any time that it is considered for the utilized machinery

To protect soil and underground against pollution in the Execution Period must be followed many measures, as follows:

- the Constructor must set up a proper construction site organisation taking into consideration the facilities and environmental factors protection by using small surfaces of land
- avoiding using land with superior qualities for construction site organization, machinery bases, temporary or final storages of offsets and construction materials
- interdiction to locate the construction site organization, machinery bases in protected areas or earth sliding areas
- will be avoided soil pollution with fuels, greases resulted from activities as stationery, supplying, storage or fuel supplying of machinery or transportation vehicles or caused by unfitting functioning of these
- any combustible or fuel storage tank will be sealed and supervised and placed on a concreted, designed with leaking gutters
- machinery and vehicles proper parking (on a concreted platform, when this is possible)
- washing and maintenance platform of the equipment must be set up with a sufficient slope to insure the collection of Wastewater resulted from washing equipment. It is recommended that in the production bases the existence of sealed collection tanks that should be empty periodic
- the selective collection of waste resulted from works execution and the evacuation depending on their nature to storage or to reuse to sanitation services, based on contract, taking into account the EGO no. 16/2001 regarding industrial recycled waste management, approved by Law no. 456/2001 and Law no. 426/2001 regarding waste condition to approve EGO no. 78/2000, with ulterior completions and alterations.
- rational storage of excavation material, in such manner to take small surface areas
- soil recovery (ecological reconstruction) in areas where this was affected trough excavation, material storage equipment stationing, in order to put back into the circuit to the initial utilisation category. When trees are cut down are to be replanted according to

the present legislation.

- controlled evacuation of Wastewater during the accomplishment of the investment, in a manner to avoid the infiltration into the phreatic layer
- sludge from the upgrading the Wastewater Treatment Plant will be managed in accordance with the present legislation
- water catchments for constructive necessities, only based on authorisations issued by competent authorities

Tender Dossier will comprise specific measurements for management of waste produced on the site, to avoid soil pollution.

➢ **During the Operating Period**

In order to protect soil and underground in Operating Period must be followed many measures, thus:

- insurance of proper maintenance of the water supply and sewerage system, and also of Wastewater Treatment Plant
- monitoring sludge quality according to present normative, in order to not affect the agricultural lands quality in case of using it as a fertiliser
- it is forbidden to discharge Wastewater on soil
- storage in proper conditions (closed spaces designed with concreted platforms, adequate recipients) of chemical substances used in the treatment process
- verifications the of water supply and sewerage systems and of Wastewater Treatment Plant impermeability and components objects are to be done periodically.

After finalising works will be accomplished:

- an elimination plan for waste during and at the end of works and cleaning the area after closing the site
- recover the temporary occupied fields and reintegrate them into the initial utilization.

2.4. GEOLOGY OF THE UNDERGROUND AND GEOMORPHOLOGY

- **During the Execution Period**

The groundwater pollution might be due to:

i. storage and handling of hazardous liquids, e.g. oil, fuel or other hazardous chemicals and

ii. compaction and destruction and subsoil stratification by heavy machinery and vehicles, reducing groundwater recharge. The expected negative impacts are considered to be minor, local and temporary.

♦ **During the Operating Period**

Potential impacts on groundwater are generated by leakages from ruptures of the existing old sewer system as well as from leakages from septic tanks. To a smaller extent, might be a risk the reuse option of stabilised sewage sludge in agriculture, especially by heavy metals, which might drain into the subsoil and groundwater. This depends on the soil conditions (acidity, solubility of heavy metals), soil structure (adsorption of heavy metals) and permeability. Therefore, the background concentration of the soil and the total sewage sludge load added to the soil has to be monitored.

The proposed priority project by rehabilitating of sewer system in Constanta agglomeration will significantly reduce the leakage of raw wastewater into the subsoil and groundwater. The expected impact by proposed replacement of sewer system will be major positive, local, permanent and direct.

This investment represents a principle project objective for the environment protection by eliminating of groundwater pollution by leakage from old and broken sewer systems and elimination the leakage from septic tanks by extension of the sewer system and new connections.

2.5. BIODIVERSITY

2.5.1. General information

Natura 2000 sites from the vicinity of the proposed investments in Constanta agglomeration are:

ROSPA 0057 –Siutghiol Lake

ROSPA 0076 – Black Sea

Rehabilitation and extension of water supply network and sewage system will be realised mostly on the side of the existing roads and the existing infrastructure in Constanta agglomeration.

2.5.2. Pollution sources

It is appreciated that during accomplishing the setting up of designed works and closing working fronts, the biodiversity quality, will come back to the anterior parameters.

Pollution sources, for flora and fauna, during sewerage network and Wastewater Treatment Plant operation period are the following:

- possible networks or Wastewater Treatment Plant defects generating pollutants and noise that may alter the specific to the Investment area flora and fauna
- waste resulted from investment operation maid affect the vegetation from the site

2.5.3. The foreseen impact over the biodiversity

The proposed Project won’t produce alterations of forest surfaces, water bodies, swamps, areas or habitats of protected plants species.

Won’t have effects upon local fauna, upon birds, mammalians, fishes, or invertebrates populations species.

2.5.4. Impact decrease measures

During investment setting up in order to not affect the present environmental impact assessment study area specific biodiversity it is necessary to apply flora and fauna protection measures, as:

- construction site organization won’t be located on surfaces that are overlapping the communitarian interest sites as well as special avifaunistic protection areas
- respecting the works chart by limiting the lines and working schedule to limit the impact on site specific flora and fauna
- utilizing silence equipment and transportation vehicles, to limit the noise caused by the activity of rehabilitation and modernization of sewerage and water supply system as well of the Wastewater Treatment Plant, that runs out animal and birds species, and also endowment with atmosphere pollutants minimization and retaining performant systems
- setting up physical barriers fencing the construction site organization in order to not affect other surfaces beside those necessary to the investment rehabilitation and modernization and implied to protect the site specific vegetation, and also to avoid accidents.
- avoiding uncontrolled storage of materials resulted from the execution works (vegetation, soil)
- selective collection, reuse and periodic elimination of waste in order to avoid to attract animals or to make them sick or cause accidents.
- prevention and removing road accidents damages that could strongly pollute the area by leakages or fires
- ecological reconstruction of all the affected surfaces when works are finalized and give those back to the initial utilization.

During the operation are to be set up protection fencing, minimizing the impact over the natural habitats and limiting animals access into the site area. Also, to avoid the appearance of diseases or to not allow the vegetation normal development it is necessary a proper maintenance of all the installations from the Wastewater Treatment Plant.

Specific measures to protect the protected areas from the investment vicinity:

- closing up to minimum the surfaces taken by construction site organization
- interdiction to locate the construction site organization in the protection area site
- interdiction to cross the protected areas with technological or access roads
- interdiction to locate possible borrowing diggings on protection areas sites
- interdiction to storage the waste resulted in the Execution Period of the Project on protection areas sites
- interdiction to storage the sludge resulted from the Wastewater Treatment Plant or from emptying tanks, channels or other existing structures on protection areas surfaces
- interdiction to set up equipment or transportation vehicles on protected natural area surface

- interdiction to discharge untreated or insufficient treated into the protected sites area

In order to minimize the impact on the Natura 2000 Sites ROSPA 0076 – Black Sea and ROSPA 0057 – Siutghiol Lake, it was proposed the following alternative solution: the rehabilitation works will be done in the summer time, in the period May – August, when the birds will not be disturbed. This solution was imposed because the species of aquatic birds do not nestle in the period May – August because are disturbed by the tourist activities.

The study on the project's impact on species for which Lake Siutghiol was declared Natura 2000 site ROSPA 0057 has led to the conclusions presented in Annex no. XXXVIII to Application Form.

2.6. LANDSCAPE

Constanța City is located in the south-east part of Romania, at 44°10′24″N 28°38′18″E. Is situated on Black Sea cost, into a lagoon area, raised in north and central parts, and plain at south and west parts. The City owns a beach with a length of 6 km. The north part of the City, Mamaia, the most populated Seaside resort, is located on a lagoon shore, with a beach of 7 km length, beach continued with other 6 km on Năvodari town territory.
The City has as neighbours Năvodari and Ovidiu towns at north, Agigea commune at south (with these three localities being bonded), Murfatlar town and Valu lui Traian commune at west, Techirghiol town and Cumpăna commune at south-west and Black Sea at east. Constanța is split in neighborhoods, the most famous being Mamaia, Casa de Cultură (Culture House) and Tomis North, without any administrative autonomy, as the districts from Bucharest, boundaries couldn't be identified exactly, exception Mamaia resort-neighbourhood that has well defined boundaries.
Execution of diggings, assembly works of pipes will cause visual impacts on the Black Sea coastline and inside the locality, on the pipes line that could generate generally discomfort to the public, locals and tourists.
Negative impact decreasing measures must comprise adequate measures to inform abaut all planed activities to residents as well as to tourists, including the purpose, time period complexity of works.
During the objective functioning there is no problem regarding landscape being affected, pipes from dry land and from the see are buried.

2.7. SOCIAL AND ECONOMIC ENVIRONMENT

From the social point of view setting up the investment has positive effects on locals life quality from Mangalia agglomeration.

Can be appreciate the positive impact over the environment by solving the Wastewater **insufficient treated** discharged into the emissary, leading to affecting physico-chemical, biological and bacteriological parameters of the Black Sea.

It can be draught the conclusion that setting up the studied objective presents advantages regarding the population comfort level and environmental protection role.

2.8. CULTURAL AND ETHNIC CONDITIONS, CULTURAL PATRIMONY

In the area where the investment is wanted aren't signalised archaeological values, historical, cultural, and architectural that could be affected by the functioning of sewerage.

In case that during construction works takes place an archaeological discovery by chance the

works are to be stopped and in maximum 72 hours the Mayor of the locality, where works are performed will be announced.

As in Article 4, paragraph (4) from EO 43/2000 – Ordinance regarding archaeological patrimony protection and declaring archaeological sites as national interest areas with ulterior modifications and alterations, according to its attributions, the Mayor will take the measures foreseen in Article 17 from the mentioned normative.

3. ALTERNATIVES ANALYSIS

3.1. Alternative 0 - Maintaining the present situation

This alternative signifies to ***not accomplish the investment***, that means to not fulfil:

- Assumed environmental commitments by Romania through **ACCESSION TREATY TO THE EUROPEAN UNION,** chapter 22 – Environment Protection.
- Staging Program included into the **WATER MANAGEMENT AUTHORISATION** no. 221/November 2008.

Maintaining the current situation will lead to environment deterioration by infiltrations and uncontrolled discharging. The solution to maintain the current situation can't be accepted for a balanced development of the area because by setting up a public infrastructure it is considered necessary to rehabilitate and modernize the sewerage, as well as to introduce tertiary treatment at Constanta South WWTP.

Constanta agglomeration represents also a touristic area, with maximal importance that need special hygiene conditions for sand and sea water utilized for bathing, even in the discharging of wastewater after treatment areas into the Black Sea.

In case of maintaining the current situation there won't be any financial effort but the population comfort level and the environmental conditions are improper for an area that suffers a continuous development.

3.2. OPTIONS FOR THE WATER SUPPLY SYSTEM

WATER SUPPLY NETWORKS

Option 1: maintaining the present configuration of the water supply system

Option 2: extension and rehabilitation of the water supply system

The analysis of these two options concluded that the selection of Option 1 is the best solution in water and wastewater treatment for Constanta municipality.

From economical point of view the selected option has the purpose of improving life quality, by reducing risk on human health.

The selected option is based on using HDPE pipes cause of their high time durability and also quick connecting techniques, fact that determines a reduced time of execution and a long life expectancy, resulting reduced operation and investments costs lower then using other materials.

The proposed solution in the present Project is good for the entire water supply system cause water loses and also the supplied water flow are reduced and in conclusion the water price.

Connecting all the consumers that are near by the segments proposed for rehabilitation to the network and metering them leads to a correct control of the supplied flow.

3.3. OPTIONS FOR SEWERAGE

The identified options in this design phase are following the solution adopted into the Master Plan, where, for Constanta South agglomeration was decided to keep and extend the existing sewerage.

Option 1: Extension of the wastewater network, with the following proposed works:

- rehabilitation/extension of the existing wastewater network
- works to modernise Constanta South Wastewater Treatment Plant, by introducing the tertiary treatment (chemical installations to eliminate phosphorus from the wastewater), executing a new settlement tank, a buffer tank to mix primary sludge with exceeded sludge, greases and foam and UV disinfection installation for the treated water; to all these is added a cogeneration unit to reduce the operation costs caused by power consume of the Wastewater Treatment Plant.

Option 2 – Introducing tertiary treatment and upgrading hall for sludge treatment from the existing Constanta South Wastewater Treatment Plant (WWTP), by introducing some technological objects (biological tank and chemical installations) to reduce nitrate and phosphorus, setting up a new secondary settlement tank and a tank to mix sludge; treated water will be passed through a UV installation, for disinfection, before discharging into the water body recipient, and also like in the previous option description a cogeneration unit.

This option follows the technological scheme presented in Option 1, with the following differences:

- modernising works of Constanta South Wastewater Treatment Plant utilizing, beside the technology mentioned previously also a tank to reduce nitrogen and phosphorus.

Selected Option

Following a technical and also a financial assessment was selected Option 1 that was considered to fulfil the criteria of an optimal and viable solution for the mentioned systems.

Following the technical-economical analyses were identified two options regarding the treatment of exceeding sludge resulted from Constanta North Wastewater Treatment Plant, in Poiana site as:

Option 1 – Setting up a sludge treatment stage by using gravitational thickeners, for pre-thicken the exceeding sludge, of some thickening, dewatering and sludge stabilization equipment, and some storage tanks, for sludge temporary storage and for dewatered sludge from Constanta South Wastewater Treatment Plant into a hall;

Option 2 – Setting up a sludge treatment stage by using some thickening, dewatering and sludge stabilization equipment, and some storage tanks; after treatment the resulted dewatered sludge with the dewatered sludge from Constanta South Wastewater Treatment Plant will be temporary stored into a hall;

This option follows the technological scheme presented in Option 1, with the following differences:

- Works to set up the exceeded sludge treatment stage from Constanta North Wastewater Treatment Plant to Poiana site, with the same functioning period; from this option is cut down the gravitational thickening tank.

3.4. Sites alternatives

Taking into consideration the studied objective there are no alternatives for the location.

3.5. Designed alternatives

Not applicable. By this Project were imposed and will be respected the present legislation regarding the execution works and also the recommendations for how to operate the water supply and sewerage system, and also the Wastewater Treatment Plant.

Proposed constructive solutions, utilised materials to set up these constructions, volumes regime and regime to develop on horizontal and vertical of investment components, finishes and architectural concept are to ensure a good functionality, a durability and a reliability of equipments and constructions.

It is considered that the chosen solution will offer a high efficiency regarding price-efficiency report and in the same time fulfils the necessary technical conditions.

3.6. Alternatives regarding the execution method

Not applicable. Were proposed modern execution methods and are to be used best quality materials.

4. MONITORING

During execution the monitoring activity will respect the specific requirements of constructions and installations activities.

In the Project implementation period will be considered the following:

- bringing of affected surfaces to the initial state
- monitoring the degradation of the road system on the routes affected directly (trough execution of diggings, pavement removal) or indirectly (as a consequence of traffic deviation on these roads)
- will be exercise a sever control to concrete transportation with special vehicles, to prevent accidental discharges on the route or throwing cement milk inside the construction site, water courses or public roads
- at the end of the week the working fronts will be cleaned, all waste being eliminated.

When starting operation at the objective will be established a monitoring system – **detailed monitoring plan** with precise measures for the Beneficiary. Will be considered the following:

- monitoring water quality that will be distribute to the consumers
- proper maintenance of the sewerage system
- monitoring water quality at the entrance and exit of the Wastewater Treatment Plant and of effluents, with the established frequency by the competent authority for environmental protection and waters management.
- maintaining the Wastewater Treatment Plant efficiency according to the Project, in a manner to ensure the water treatment according to the present legislation

- proper maintenance of the sewerage system, to avoid disfunctionalities on the evacuation route and Wastewater treatment
- monitoring the sludge quality in accordance with Ord. 344/2004 or Ord. 95/2005, depending on sludge destination.

Impositions into the contracts (regarding taking or evacuating into the Wastewater sewerage network), signed with divers economical agents, of a condition to include the Wastewater in the conditions from GD 188/2002 – NTPA 002/2002, modified and completed trough GD 352/2005 regarding Wastewater evacuation.

Accomplishing monitoring measures will be set up in their own authorised laboratory, using standardized methods. The results of the self monitoring will be recorded and transmitted to the environmental authorities.

Monitoring the environment in the Execution Period, and also during the Operation Period of the Wastewater Treatment Plant aims to apply the proposed measures by the present Report to Environment Impact Assessment Study when generating a minimum environmental, over population and localities impact, in order to follow the sustainable development concept.

5. RISK SITUATIONS

In the execution period, and also in the operation period of the Project **„Rehabilitation and modernization of water and wastewater supply system in Constanta-Ialomita region–Constanta agglomeration”** is the possibility to appear accidents with a significant environmental impact, generated by the following activities:

- Collecting the sludge from emptying any tank, channel or other existing structure cause of Wastewater Treatment Plant rehabilitation
- Transportation and manipulation of toxic and dangerous substances as combustibles, chemical substances utilised in the treatment process
- Supplying of the equipment and construction machinery with combustibles
- Losses from fuels storages , where the tanks are not impermeable
- Accidents of construction materials that are transporting toxic or dangerous substances.

6. ACCIDENTS PREVENTION MEASURES

In order to prevent potential accidents resulted as a consequence of the developed activities for the analysed objective, it is necessary to adopt the following measures:

- monitoring the equipment functioning manner, the impermeability of oil and fuel, for transportation vehicles and equipment, storage recipients
- setting up fences, signalising and other warnings to limit working areas.
- to prevent risks of producing pollutions from accidents will be elaborated intervention programs that would foreseen the necessary measurements, teams, intervention endowments and equipments in case of accident.
- verifying the equipment and transportation vehicles before starting works if these are functioning in optimal parameters and if are not possible defections that could lead to possible combustible losses

- verifying at clocked periods, of electrical installations, of comprised air, oxygen tanks or other explosive, inflammable, toxic or dangerous materials if are functioning at optimal parameters
- immediate action in case of accidents of authorities with ability and take measures to eliminate the pollutants and ecological rebuild of the affected area.
- implementing an emergency call system to ensure the possibility to transmit information characterised like emergencies, as accidents.

7. NECESSARY WORKS TO REHABILITATE THE TEMPORARY UTILISED SURFACES AND ECOLOGICAL REBUILDING OF PERIPHERAL AREAS AFFECTED BY WORKS

Because there are no areas or environmental factors affected were foreseen no ecological reconstruction works.

There are possible minor events in the works execution period in punctual areas, as accidental pollution with fuel from vehicles and equipments, exceed the noise level into the functioning equipment area.

There are foreseen rebuilding works and initial state improving by redoing the vegetal layer.

All works are to be executed under strict supervision of inspectors, and after finishing the construction works will be executed works to rebuild the area and give it beck to the natural circuit, thus:

- demolish the constructions and the structures specific to the construction site organisation
- collecting, reusing and transporting out of the site of the waste resulted from the execution activity
- rebuilding the site in the access, technological roads area and others temporary occupied surfaces by levelling the soil, becoming overgrown with grass and landscaping arrangements by consulting botanists, landscape and horticulture specialists
- rebuilding the vegetal layer immediately after finishing works
- decontaminating the areas that were accidentally polluted with hydrocarbons or other dangerous substances
- testing the soil to decide the level of pollution caused by the construction activity in order to apply measures to lead to give back a satisfactory state to the area

8. CONCLUSIONS AND RECOMMENDATIONS

The Report to the study of impact assessment takes out the causes and consequences of negative and positive effects over the environmental factors caused by implementing the Project „Rehabilitation and modernization of water and wastewater supply system in Constanta County–Constanta agglomeration”.

When elaborating the present report were considered the following elements:

- Reports, analyses, environmental studies and documents offered by the Beneficiary and by the Designer
- Present legislation regarding the environment protection
- Complying with the imposed normative by the local environmental protection authority
- Local Environment Action Plan
- Annual Reports regarding environmental factors state for Constanta County - 2008
- Special literature data, guides, guidance , normative, encyclopaedias

Environmental impact assessment was elaborated by considering the numbered criteria from the tables no. 10.1 and no.10.2, being structured by the following fields:

- Alterations over the environment factors
- Effects of alterations of the environment factors upon the population

The principal aspects regarding environment factors reffers to the pollution of water, soil, air, human settlements and also to the landscape degradation.

In the conditions in which the technological proccess and protection measurements are respected, it can be evaluated that the impact of execution and implementation of the project on the environment factors is insignifiant.

In the conditions of corect administration of the materials used to improve the water supply system and sewer system from Constanta agglomeration, the quality of the air it doesn`t change.

If the necessary protection measure are taken into consideration, the execution activities and implementing of the project won`t have a potential polluting impact on the soil and subsoil.

The execution activities and implementation of the project it will take place in the proved location, without affecting the limitoph area; in this way the impact on the terestrial and aquatic ecosistems it will be insignifiant. More, by introducing the tertiary treatment at the Constanta South WWTP, the treated water will comply with the european and romanian regulations imposed at the discharge in the Black Sea emmisar.

The general impact on tjhe human settlements and on public objectives is low and compared with the actual situation, it will be positive.

By analysing the Project situation in the elaborating process of **ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT**, were underlined the measurements that should be respected by the **Constructor** and **the operator of the water supply and sewerage in Constanta County–Constanta agglomeration**, in the execution period and also in the operation period to be as the environment protection present legislation demands.

It is not the case for supplementary measurements, considered as efficient to minimise the impact.

The Project represents measure with important positive effects upon the environment.

At the end, can be drown a conclusion that negative effects appeared during accomplishing the objective, presented in this report, do not lead to environment factors alteration.

Table 10.1. Alterations of the environmental factors

CRITERIA	EFFECTS ESTIMATION
▪ **negative effects upon the health of the biotope**	▪ insignificant
▪ **warning to rare or in danger species**	▪ rare or in danger species were not defined in the area
▪ **reducing species diversity or perturbing the alimentation chain**	▪ insignificant
▪ **loosing or splitting habitats**	▪ insignificant
▪ **discharging or producing persistent chemical substances, microbiological agents, nutrients, radiations, thermal energy**	▪ not applicable. Discharged Wastewater into the emissary will be treated and will respect the maximal admitted limits by NTPA 001 and the Water Management Permit no. 1221/8.05.2008
▪ **exploiting environmental material resources**	▪ with insignificant effect
▪ **transforming the natural landscape**	▪ with insignificant effect The general impact of the accomplishment of the investment upon the landscape characteristic to the Wastewater Treatment Plant area can be considered as a positive one.
▪ **obstruction of the migration or the passing ways**	▪ with insignificant effect
▪ **negative effects upon the quality or quantity of the biophysical environment (surface waters, underground water, soil, air)**	▪ with insignificant effect Discharged Wastewater into the emissary will be treated and will respect the maximal admitted limits by

Table 10.2. Effects of the alterations of the environmental factors upon the population

CRITERIA	EFFECTS ESTIMATION
▪ **negative effects upon the human health**	▪ these kind of effects are not marked; can be appreciated that the population comfort level will be increased by accomplishing the investment
▪ **increasing the number of unemployed or economical damage**	▪ positive effects; creating new jobs; offers an increase to the population comfort level
▪ **reducing the quality and the quantity of the recreational capacity**	▪ with insignificant effects; accomplishing the investment can influence positive the possibility for touristic development.
▪ **major alterations in the current utility of the land and of resources in traditional purposes by the local population**	▪ with insignificant effects; rehabilitating the Wastewater Treatment Plant has no necessity for new lands
▪ **negative effects upon the historical, archaeological, paleotological and architectural resources**	▪ insignificant effects, irrelevant for the location of the analysed objective
▪ **reducing the esthetical values or modifying the visual valences**	▪ positive effects; improving the urban scenery during rainy periods
▪ **affecting future utilisations of resources and coastline**	▪ will influence positively the natural resources of the coastline area
▪ **loosing or reducing rare or in danger species, and theirs habitats**	▪ insignificant

MUNICIPAL SERVICES PROJECT - CONSULTING SERVICES FOR
BRAILA, VRANCEA, ILFOV, IALOMITA AND CONSTANTA COUNTIES

ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

„REHABILITATION AND MODERNIZATION OF WATER AND WASTEWATER SUPPLY SYSTEM IN CONSTANTA- IALOMITA REGION”

NON-TECHNICAL SUMMARY
HARSOVA AGGLOMERATION

Evaluators of the Environmental Impact Assessment Study Report:

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TAHAL CONSULTING ENGINEERS LTD

CONTENT

1. PROJECT DESCRIPTION

The purpose of this investment is to rehabilitate and modernise the sewerage network, as well as the Wastewater Treatment Plant in Harsova agglomeration.

In accordance with the Town-planning Permit no. 130/20.11.2008, the construction site is located in the administrative area of Harsova Town. It is public property of the town administrated by Harsova Local Council.

From an economical point of view the site is located in Harsova town constructible perimeter and has the following utilisation categories: *streets* – sites where will be set up public networks and *construction field* –sites where will be constructed pumping stations, Wastewater treatment plant and boreholes.

The site has access to communication networks, for vehicles and humans. The site can be connected to water supply and sewerage networks, electrical power and phones that already exist in the area.

1.1. Project site location

Project foreseen works are located in Harsova locality, developed on the National Road DN 2A, road that connects Harsova and Constanta localities.

The locality has the following neighbours:

- in the North-West part Vadu Oii locality;
- in the North-East part Ciobanu locality;
- in the South-East part Ghindaresti locality;
- in the South-West part Danube.

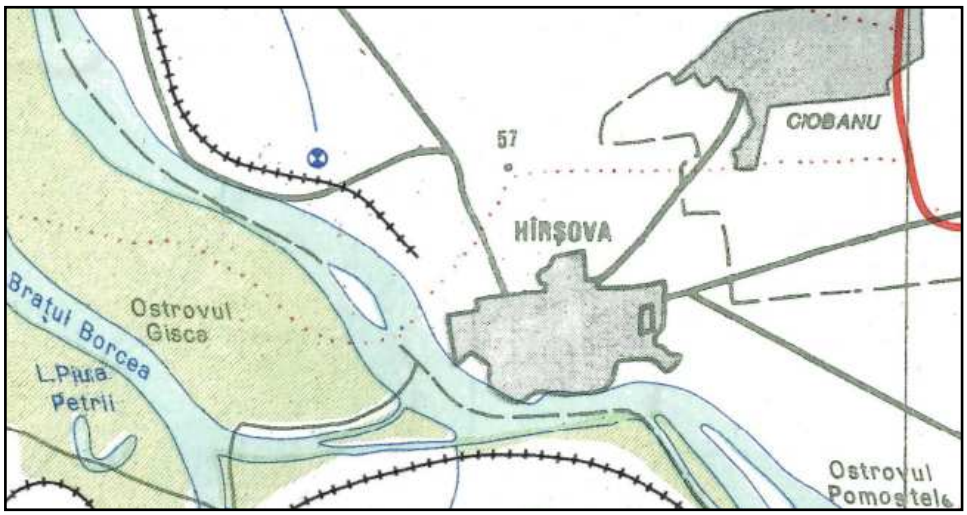


Fig.1 Works location

The proposed works included in the project are:

- Setting up boreholes
- Extension and rehabilitation of water pipe
- Setting up discharging pipes
- Setting up wastewater Pumping Stations
- Setting up a Wastewater Treatment Plant

Setting up a Wastewater Treatment Plant

The Wastewater Treatment Plant proposed with classical technology will ensure the separation and removal of no purifying elements contained by the wastewater, bringing them into the limits for discharging into the water body recipients, according to NTPA 001/2005 for localities under 10,000 inhabitants.

The dimensioning calculation for the Wastewater Treatment Plant is attached. The starting calculation data for the maximum capacity is based on the number of population equivalent of 12750.

The treatment scheme complies to the wastewater characteristic flows, to the pollution indicators concentration sand aims to retain suspension matters (MTS), floating maters, to eliminate the organically biodegradable substances (noted as BOD_5), nitrification, denitrification and aerobe sludge stabilization.

Site organisation will use the existing locations or mobile caravans for technical personnel and for stock storage.

In order to characterize the waste for the Project „**Rehabilitation and modernization of water and wastewater supply system in Constanta County–Harsova agglomeration**” it is necessary an analysis of these as well for the execution period and for the operation period.

The waste resulted from the investment *execution* activity are represented by:

- Domestic waste
- Technological waste and construction waste
- Connected activities waste

A part of the generated waste from the execution period will be recycled.

The waste resulted from the Wastewater Treatment Plant *operation* activity, are represented by:

- domestic waste
- solid waste retained by grids and sieves
- sludge from the municipal Wastewater treatment (treatment sludge in case that were stored inside the Wastewater Treatment Plant or existing in different channels, tanks, pipes in rehabilitation)
- waste resulted from sand separator
- solid waste retained on grates and screen

2. ENVIRONMENTAL IMPACT ASSESSMENT

2.1. Environmental factor WATER

Constanta county territory is part of two distinct structural, geological and hydro geological separated by a big tectonically fault named „ Capidava – Ovidiu overthrust line”, named after the two localities located at the extreme points:

- north unit of Central Dobrogea
- south unit of South Dobrogea

The hydrographical network is represented by Danube River.

Danube River – is the second river in Europe after Volga River, being the only European river that flows from the west side to east side. It flows from the Dark Forest Mountains (Germany) under two branches Brigach and Breg who flows from the Kandel edge (1214 m) and these two rivers combines in Donaueschingen (678m) in the yard of the Castle Fürstenberg. The Danube River flows from the south-east side on a distance of 2860 km, until to the Black Sea. At the influx of the Danube River into the Black Sea the danube Delta was created.

2.1.1. Water pollution sources and pollutions emissions

- **Execution Period**

In the proposed Objective Execution Period the main sources of water pollution are represented by the construction site organization, the equipment and transportation vehicles traffic, works for setting up the investment.

The impact upon the water environmental component in the execution period of the investment is **insignificant and temporary**.

- **Operating Period**

In the investment operating period the pollution sources are the following:

- untreated or insufficient treated Wastewater discharged into the recipient body water;
- petroleum products losses from vehicles that serves the sewerage or auto ways that are in transit;
- losses, in case of damage, from the technological water line and sludge line from the Wastewater Treatment Plant;
- accidental pollution caused by loosing the impermeability or defect tanks or sewerage channels connection or defection at the Wastewater Treatment Plant;
- water contamination caused by improper conditions for storage of chemical substances used for water treatment , as well as not to observe hygiene and cleaning conditions;

In case if the technological flux is carefully and strictly followed, the investment won’t produce pollutions to affect the environmental factors: soil, surface and underground waters, the impact being appreciated as **insignificant.**

2.1.2. Water protection measures

➢ **Execution Period**

To prevent and to control the water pollution in the construction period we are recommending the following measures:

- to avoid discharging into the emissary of waters with a high level of solid suspensions, caused by the construction activity, without a pre settlement of those ones.
- sludge produced by emptying any tank, channel or other existing source will be stored and evacuated in accordance with the present legislation regarding sludge management
- water catchments for constructive necessities will be accomplished only based on issued authorisations by competent authorities
- proper maintenance of utilised machineries to perform the foreseen works in the Project and storage in the foreseen conditions from the present legislation of construction materials and consumables
- any storage tank of combustibles or fuels will be carefully impermeabilizated, supervised and located on a concreted platform, designed with gutters.
- it is forbidden to use asbestos to the executed constructions.
- will be set up sewerage systems, treatment and discharging of storm water that are washing the platform of construction organization site.
- fuels and waste greases will be turned to specialised units

➢ **Operating Period**

For water protection in the Wastewater Treatment Plant functioning stage it is necessary to follow the measures:

- insurance of proper maintenance for the Wastewater Treatment Plant
- monitoring water quality at the entrance and at the exit of the Wastewater Treatment Plant and applying measures to decontaminate them before discharging
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals; these will be manipulated by trained personnel, in order to avoid water contamination with such substances measures will be taken
- an Intervention Plan in case of accident will be elaborated
- training the personnel about work conditions and maintaining a high level for hygiene and cleaning standard
- insurance of a strict management for installations functioning , as well for the Wastewater flow, that could affect the discharged water quality;
- periodic control of the installations and checking of the impermeability, operative defections remediation
- technical state and inside sewerage network functioning control

2.2. Environmental factor AIR

Climatic particularities of the Dobrogean territory in this area highlights an intense continental level characterised by big day/night and annual oscillations values of air temperature, reduced humidity and reduced precipitations quantities.

Into the registered data base from Harsova meteorological station on a long period of time we can highlight the main area climatic characteristics.

2.2.1. Generated sources and pollutants

- **Execution Period**

The investment Execution Period from Harsova agglomeration is characterised by the following pollution sources:

- powder and dust generated be the investment’s rehabilitation and modernization works. Emission of these pollutants will be limited in time for this site. Works will be executed on sections that are scheduled successive depending on the execution chart and the rhythm to finalize works.
- machinery and equipments by their functioning in the working fronts area. Machinery and equipments specific activity pollution is appreciated depending on fuel consume that are generating pollutants like: NOx, SOx, CO, COV_{nm}, aldehydes, hydrocarbons , organic acids, suspension and sedimentables particles
- the traffic to accomplish the investment, traffic specific pollution is appreciate upon fuel consume that generates pollutants as: NOx, CO, COV_{nm}, suspension and sedimentables particles.
- improper maintenance of machinery and equipments
- dust generated by the machinery and equipments traffic and construction materials manipulations
- unpleasant odours generated by the existing sludge evacuation from tank, channel or other existing source, under rehabilitation works
- improper storage conditions for combustibles utilised to accomplish the construction works

- **Operating Period**

During the investment rehabilitation and modernization works it is appreciate those sources of air pollution stops.

2.2.2. Impact on air

- **During the Execution Period**

The performed works during the objective execution period have a reduced impact upon the working and neighbourhood area atmosphere quality.

Works for construction site organization will be elaborated and executed correctly, with modern endowments to reduce the emission of noxes in the air, water and on soil. Grouping these into a single site is good by decreasing the impact areas and promotes a controlled and correct operation.

- **During the Operating Period**

The entire dewatering process is performed mechanic being automatic. During the treatment technologic process there aren't produced any gaseous noxes or odours.

Through the adopted technology, the domestic residual waters and sludge resulted are continuous treated being excluded from the anaerobe fermentation area with noxes production as: sulphured hydrogen, methane, carbon dioxide.

The gross retains from the raw water from the automated grids will be transported periodically and are not producers of bad odours.

The sludge is stabilised by aeration and dewatered mechanically through a performant automatic mechanical procedure.

2.2.3. Impact decreasing measures

- **During the Execution Period**

For air protection during the construction period were proposed the following measures:

- Performing section works, in accordance with execution charts; correlation of works site machinery working charts with those from the production bases.
- Minimising dust and suspension powder emissions resulted from execution works, pipes replacing etc. by applying technologies that are leading to fulfil the demands of STAS 12574-87 regarding atmosphere protection
- Technological machinery will fulfil the requests of GD no. 743/2002 regarding the establishment of approving type procedures of internal combustion motors, intended for mobile off-road machinery and establishing limits for gas and pollutant particles emissions from these
- Performing periodical technical inspections of construction machinery.
- Maintenance and service for machinery and vehicles utilised to reduce the atmosphere pollutants
- The fuel supply of transportation vehicles will be done only in fuel distribution centres.
- Setting up special platforms for materials, machinery and waste storage
- Activities that are producing a lot of dust will be reduced during strong wind periods, or will be done a surface moistening
- Periodical verification of machinery and transportation vehicles regarding the carbon monoxide emission level and others exhaust gases and commissioning only after repairing the possible defections.

- **During the Operating Period**

For air protection during the operation period were proposed the following measures:

- sewerage and water supply systems, as well as Wastewater Treatment Plant proper operation and maintenance,
- reducing the energy consumption
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals and only by specialised in this field personnel
- the storage of possible inflammable or explosive substances will be done only strictly following the present legislation

2.3. Environmental factor SOIL

2.3.1. Soil and underground pollution sources

- **During the Execution Period**

During the execution period the potential pollution sources of soil and underground could be:

- traffic of utilised vehicles and heavy machinery generates pollutants from burning combustibles, as well as from machinery functioning into the working fronts.
- accidental fuel, greases, cement, chemical substances or pollutant materials loses during the manipulation and storage;
- improper maintenance and technical defects of machinery, fuel supply, equipment repairing, accidents that may generate combustibles and grease leakages that can lay on soil, leading to structural alteration of soil.
- waste resulted in technological processes and the domestic waste can settle and pollute the soil
- uncontrolled storage and on unarranged spaces of fuels and greases as well as other materials necessary for works execution;
- improper storage of the sludge resulted from the rehabilitation and modernization of the Wastewater Treatment Plant
- sagging soils by heavy construction machinery through the material storage landfills
- taking out of the usual utilisation terrains in order to accomplish the construction site organisation
- the excavations executed for the new boreholes or to replace or set up new pipes
- untreated or partially treated Wastewater exfiltrations into soil or underground, caused by replacing pipes works
- untreated Wastewater discharges on soil or infiltrations into the phreatic layer during the rehabilitation of the Wastewater Treatment Plant

- **During the Operating Period**

During the operation period the potential sources of pollution for soil and underground are represented by:

- defaults caused by clogged pipes or caused by accidental fissures.
- improper functioning of the Wastewater Treatment Plant can lead to soil pollution.
- untreated or insufficient treated Wastewater discharged on soil
- untreated or partially treated Wastewater exfiltrations into soil or underground
- uncontrolled utilisation of sludge on agricultural lands, in the case when this one does not fulfil regarding the quantity, or isn’t applied in the proper quantities according to the present legislation
- storage in improper conditions of chemical substances utilised for water treatment.
- improper storage of technological wastes resulted from the activity of operation and maintenance of the Wastewater Treatment Plant

2.3.2. Impact on soil and underground

- **During the Execution Period**

During this period of time appears a physical impact on soil by performing specific works of the Investment. In accordance, the impact signifies the followings:

- temporary utilizations of fields for construction site organization, technological roads and degrading soils quality
- combustibles losses, greases on soil surface resulted from the parking spaces, fuels supply pumps, accidents could affect significant the soil quality
- technological waste, waste resulted from traffic stored improper on soil surface that can alter the soil quality

- **During the Operating Period**

Soil pollution can appear as a consequence of improper storage of technological waste resulted from the activity of operation and maintenance of water supply and sewerage system and also of the Wastewater Treatment Plant.

Improper functioning of the investment can lead to soil pollution.

The Wastewater transportation pipes cracking can lead to soil and underground water pollution.

2.3.3. Soil and underground protection measurements

- **During the Execution Period**

In order to avoid the water and underground pollution, during the execution period are to be performed verifications and any time that it is considered for the utilized machinery

To protect soil and underground against pollution in the Execution Period must be followed many measures, as follows:

- the Constructor must set up a proper construction site organisation taking into consideration the facilities and environmental factors protection by using small surfaces of land
- avoiding using land with superior qualities for construction site organization, machinery bases, temporary or final storages of offsets and construction materials
- interdiction to locate the construction site organization, machinery bases in protected areas or earth sliding areas
- will be avoided soil pollution with fuels, greases resulted from activities as stationery, supplying, storage or fuel supplying of machinery or transportation vehicles or caused by unfitting functioning of these
- any combustible or fuel storage tank will be sealed and supervised and placed on a concreted, designed with leaking gutters
- machinery and vehicles proper parking (on a concreted platform, when this is possible)
- washing and maintenance platform of the equipment must be set up with a sufficient slope to insure the collection of Wastewater resulted from washing equipment. It is recommended that in the production bases the existence of sealed collection tanks that should be empty periodic

- the selective collection of waste resulted from works execution and the evacuation depending on their nature to storage or to reuse to sanitation services, based on contract, taking into account the EGO no. 16/2001 regarding industrial recycled waste management, approved by Law no. 456/2001 and Law no. 426/2001 regarding waste condition to approve EGO no. 78/2000, with ulterior completions and alterations.
- rational storage of excavation material, in such manner to take small surface areas
- soil recovery (ecological reconstruction) in areas where this was affected trough excavation, material storage equipment stationing, in order to put back into the circuit to the initial utilisation category. When trees are cut down are to be replanted according to the present legislation.
- controlled evacuation of Wastewater during the accomplishment of the investment, in a manner to avoid the infiltration into the phreatic layer
- sludge from the upgrading the Wastewater Treatment Plant will be managed in accordance with the present legislation
- water catchments for constructive necessities, only based on authorisations issued by competent authorities

➢ **During the Operating Period**

In order to protect soil and underground in Operating Period must be followed many measures, thus:

- insurance of proper maintenance of the water supply and sewerage system, and also of Wastewater Treatment Plant
- monitoring sludge quality according to present normative, in order to not affect the agricultural lands quality in case of using it as a fertiliser
- it is forbidden to discharge Wastewater on soil
- storage in proper conditions (closed spaces designed with concreted platforms, adequate recipients) of chemical substances used in the treatment process
- verifications the of water supply and sewerage systems and of Wastewater Treatment Plant impermeability and components objects are to be done periodically.

After finalising works will be accomplished:

- an elimination plan for waste during and at the end of works and cleaning the area after closing the site
- recover the temporary occupied fields and reintegrate them into the initial utilization.

2.4. GEOLOGY OF THE UNDERGROUND AND GEOMORPHOLOGY

- **During the Execution Period**

The groundwater pollution might be due to:

iii. storage and handling of hazardous liquids, e.g. oil, fuel or other hazardous chemicals and

iv. compaction and destruction and subsoil stratification by heavy machinery and vehicles, reducing groundwater recharge. The expected negative impacts are considered to be minor, local and temporary.

- **During the Operating Period**

Potential impacts on groundwater are generated by leakages from ruptures of the existing old sewer system as well as from leakages from septic tanks.

To a smaller extent, might be a risk the reuse option of stabilised sewage sludge in agriculture, especially by heavy metals, which might drain into the subsoil and groundwater. This depends on the soil conditions (acidity, solubility of heavy metals), soil structure (adsorption of heavy metals) and permeability. Therefore, the background concentration of the soil and the total sewage sludge load added to the soil has to be monitored.

The proposed priority project by rehabilitating of sewer system will significantly reduce the leakage of raw wastewater into the subsoil and groundwater. The expected impact by proposed replacement of sewer system will be major positive, local, permanent and direct.

This investment represents a principle project objective for the environment protection by eliminating of groundwater pollution by leakage from old and broken sewer systems and elimination the leakage from septic tanks by extension of the sewer system and new connections.

2.5. BIODIVERSITY

2.5.1. Protected areas from the investments vecinity

Natura 2000 network from the vicinity of the investments that will be set up in Harsova agglomeration:

- **Special Protection Avifaunistical (SPA)**

ROSPA 0017 – Canarale from Harsova

- **Sites of Comunitary Importance (SCI)**

ROSCI 0022 – Canarale of Danube

Harsova WWTP is situated, in a higher area (7m high), at an approximate distance of 300m from the Danube margin, being surrounded by agricultural lands, fields and greensward.

2.5.2. Pollution sources

It is appreciated that during accomplishing the setting up of designed works and closing working fronts, the biodiversity quality, will come back to the anterior parameters.

Pollution sources, for flora and fauna, during sewerage network and Wastewater Treatment Plant operation period are the following:

- possible networks or Wastewater Treatment Plant defects generating pollutants and noise that may alter the specific to the Investment area flora and fauna
- waste resulted from investment operation maid affect the vegetation from the site

The foreseen impact over the biodiversity

The proposed Project won’t produce alterations of forest surfaces, water bodies, swamps, areas or habitats of protected plants species.

Won’t have effects upon local fauna, upon birds, mammalians, fishes, or invertebrates populations species.

2.5.3. Impact decrease measures

During investment setting up in order to not affect the present environmental impact assessment study area specific biodiversity it is necessary to apply flora and fauna protection measures, as:

- construction site organization won't be located on surfaces that are overlapping the communitarian interest sites as well as special avifaunistic protection areas
- respecting the works chart by limiting the lines and working schedule to limit the impact on site specific flora and fauna
- utilizing silence equipment and transportation vehicles, to limit the noise caused by the activity of rehabilitation and modernization of sewerage and water supply system as well of the Wastewater Treatment Plant, that runs out animal and birds species, and also endowment with atmosphere pollutants minimization and retaining performant systems
- setting up physical barriers fencing the construction site organization in order to not affect other surfaces beside those necessary to the investment rehabilitation and modernization and implied to protect the site specific vegetation, and also to avoid accidents.
- avoiding uncontrolled storage of materials resulted from the execution works (vegetation, soil)
- selective collection, reuse and periodic elimination of waste in order to avoid to attract animals or to make them sick or cause accidents.
- prevention and removing road accidents damages that could strongly pollute the area by leakages or fires
- ecological reconstruction of all the affected surfaces when works are finalized and give those back to the initial utilization.

During the operation are to be set up protection fencing, minimizing the impact over the natural habitats and limiting animals access into the site area. Also, to avoid the appearance of diseases or to not allow the vegetation normal development it is necessary a proper maintenance of all the installations from the Wastewater Treatment Plant.

Specific measures to protect the protected areas from the investment vicinity:

- closing up to minimum the surfaces taken by construction site organization
- interdiction to locate the construction site organization in the protection area site
- interdiction to cross the protected areas with technological or access roads
- interdiction to locate possible borrowing diggings on protection areas sites
- interdiction to storage the waste resulted in the Execution Period of the Project on protection areas sites
- interdiction to storage the sludge resulted from the Wastewater Treatment Plant or from emptying tanks, channels or other existing structures on protection areas surfaces
- interdiction to set up equipment or transportation vehicles on protected natural area surface
- interdiction to discharge untreated or insufficient treated into the protected sites area

- construction works will not be done in the birds period (April – June), in order to assure birds the necessary quiet in this important period of their life.

2.6. LANDSCAPE

Located to the north-west part of Constanta county, on the right shore of Danube, downstream of the confluence of the old branch of Danube with Borcea Branch, at 10 Km of the confluence of Danube with Borcea Branch. The distance towards the county residence, Constanta City, is 85 Km.

There are many archaeological researches developed in Harsovei area, where cthe research points leaded to the conclusion that in this part of Dobrogea are sufficient evidences to demonstrate the existence of human communities since old times.

In the centre of Harsova town exists 4 area and objectives with patrimony value categories:

- areas with archaeological evidences – with national cultural patrimony value;
- areas with archaeological evidences – with local cultural patrimony value;
- buildings –architecture monuments – with local cultural patrimony value;
- natural areas with patrimony value.

There are archaeological evidences situated outside the construction area. About one third of the surface of the centre of the town – south-east part, limited by Decebal and Scolii la vest streets, Plantelor Street at north, Danube shore at South, contains archaeological evidences from that some have national importance and in the central area are buildings with local patrimony value.

The Danube shore has 2 rocky excrescences, eroded by water, with landscape value, with a regime of natural protected area (canarale). Canaralele from Harsova Harbour are located downstream of the present harbour, on the right shore of Danube River, where water branches are together for a short time. Harsova “canarale” are representing old limestone extraction sites with a unique landscape value from the entire county.

Through GD 2151/2004 Celea Mare-Valea lui Ene area was declared natural protection area, with a total surface of 54,1 ha. The protection area comprises allotments and sub-allotments 23 N1, 23 A, 23 B, 23 C, 23 D dun UP IV Tichilesti- Harsova Forests Direction (Forests Office).

Performing diggings, mountings of pipes works will cause visual impacts inside the locality, on the pipes course that could generate a discomfort generally to the public, locals and tourists.

Decreasing measures of the negative impact must comprise adequate informing measures over all planned activities towards the residents and also to tourists, including the purpose, time period and works surface.

During the objective functioning period the landscape can’t be affected, the pipes from the dry land and from under water being buried.

2.7. SOCIAL AND ECONOMIC ENVIRONMENT

From the social point of view setting up the investment has positive effects on the life quality of the local population from Harsova agglomeration.

Can be appreciate the positive impact over the environment by solving the Wastewater **insufficient treated** discharged into the emissary, leading to affecting physico-chemical, biological and bacteriological parameters of Danube.

It can be draught the conclusion that setting up the studied objective presents advantages regarding the population comfort level and environmental protection role.

2.8. CULTURAL AND ETHNIC CONDITIONS, CULTURAL PATRIMONY

In the area where the investment is wanted aren’t signalised archaeological values, historical, cultural, and architectural that could be affected by the functioning of the water supply and sewerage system.

In case that during construction works takes place an archaeological discovery by chance the works are to be stopped and in maximum 72 hours the Mayor of the locality, where works are performed will be announced.

As in Article 4, paragraph (4) from EO 43/2000 – Ordinance regarding archaeological patrimony protection and declaring archaeological sites as national interest areas with ulterior modifications and alterations, according to its attributions, the Mayor will take the measures foreseen in Article 17 from the mentioned normative.

3. ALTERNATIVES ANALYSIS

3.1. Alternative 0 - Maintaining the present situation

This alternative signifies to ***not accomplish the investment*** that means to not fulfil:

- Assumed environmental commitments by Romania through **ACCESSION TREATY TO THE EUROPEAN UNION,** chapter 22 – Environment Protection.
- Conformation Program included into the **ENVIRONMENTAL PERMIT**.

Maintaining the current situation will lead to environment deterioration by infiltrations and uncontrolled discharging. The solution to maintain the current situation can’t be accepted for a balanced development of the area because by setting up a public infrastructure it is considered necessary to rehabilitate and modernize the sewerage, as well as to set up a Wastewater Treatment Plant.

In case of maintaining the current situation there won’t be any financial effort but the population comfort level and the environmental conditions are improper for an area that suffers a continuous development.

3.2. Options for investments

Following the options analyse were identified the proper solutions to improve the sewerage system in accordance with the Project objectives.

This alternative signifies that investment is not accomplished, that means the continuation of the discharge of **untreated** domestic wastewater from Harsova agglomeration into the recipient body water. The taken into account alternatives, when elaborating the technical

documentation are:

The proposed investment to improve the sewerage from Harsova agglomeration is the introduction of three domestic wastewater pumping stations, as well as a Wastewater Treatment Plant.

A. Pumping Stations

Option 1: Without pumping stations

Option 2: Foreseen the pumping stations

Option 1: - Without pumping stations

In the present sewerage of Harsova locality covers the entire locality and discharges the wastewater directly into the Danube by three discharging pipes. Setting up a gravitational pipe parallel with the Danube shore which is to lead the water to the new designed Wastewater Treatment Plant is not possible cause of the relief of the area, so the option no. 2 represents the only option that could be taken into consideration.

Option 2: - Foreseen the pumping stations

The chosen option for the sewerage of Harsova locality is represented by the location of three domestic wastewater pumping stations that will take the entire collected flow from the locality and pumped to the Wastewater Treatment Plant.

So by foreseeing those 3 pumping stations will be at smaller laying depths, slopes and better speeds, will forbid the clogging and will allow a easier maintenance.

SELECTED OPTION

After a technical and financial assessment was selected **Option 2 – „foreseen the pumping stations”,** considering that getters the criteria of an optimal and viable solutions for the mentioned systems.

B. Wastewater Treatment Plant

Following some technical-economical analyses were identified two options regarding the technical scheme of the Wastewater Treatment Plant:

Option 1:

The treatment scheme comprises the mechanical treatment of the wastewater with primary settlement, biological treatment with partial phosphor removal, nitrification and denitrification, phosphor chemical precipitation, disinfection of the treated water, anaerobe stabilization and sludge dewatering.

Option 2:

The treatment scheme comprises the mechanical treatment of the wastewater without primary settlement, biological treatment with partial phosphor removal, nitrification and denitrification, phosphor chemical precipitation, disinfection of the treated water, anaerobe stabilization of sludge in the aeration tanks and sludge dewatering.

SELECTED OPTION

After a technical and financial analyse is proposed the selection of option 2 to set up the Wastewater Treatment Plant for Harsova locality and namely using the treatment scheme, comprising mechanical treatment of the wastewater without primary settlement, biological

treatment with partial phosphor removal, nitrification and denitrification, phosphor chemical precipitation, disinfection of the treated water, anaerobe stabilization of sludge in the aeration tanks and sludge dewatering.

3.3. Sites alternatives

Taking into consideration the studied objective there are no alternatives for the location.

3.4. Designed alternatives

Not applicable. By this Project were imposed and will be respected the present legislation regarding the execution works and also the recommendations for how to operate the water supply and sewerage system, and also the Wastewater Treatment Plant.

Proposed constructive solutions, utilised materials to set up these constructions, volumes regime, regime to develop on horizontal and vertical of investment components, finishes and architectural concept are to ensure a good functionality, a durability and a reliability of equipments and constructions.

It is considered that the chosen solution will offer a high efficiency regarding price-efficiency report and in the same time fulfils the necessary technical conditions.

3.5. Alternatives regarding the execution method

Not applicable. Were proposed modern execution methods and are to be used best quality materials.

4. MONITORING

During execution the monitoring activity will respect the specific requirements of constructions and installations activities.

In the Project implementation period will be considered the following:

- bringing of affected surfaces to the initial state
- monitoring the degradation of the road system on the routes affected directly (trough execution of diggings, pavement removal) or indirectly (as a consequence of traffic deviation on these roads)
- will be exercise a sever control to concrete transportation with special vehicles, to prevent accidental discharges on the route or throwing cement milk inside the construction site, water courses or public roads
- at the end of the week the working fronts will be cleaned, all waste being eliminated.

When starting operation at the objective will be established a monitoring system – **detailed monitoring plan** with precise measures for the Beneficiary. Will be considered the following:

- monitoring water quality that will be distribute to the consumers
- proper maintenance of the sewerage system
- monitoring water quality at the entrance and exit of the Wastewater Treatment Plant and of effluents, with the established frequency by the competent authority for environmental protection and waters management.
- maintaining the Wastewater Treatment Plant efficiency according to the Project, in a manner to ensure the water treatment according to the present legislation

- proper maintenance of the sewerage system, to avoid disfunctionalities on the evacuation route and Wastewater treatment
- monitoring the sludge quality in accordance with Ord. 344/2004 or Ord. 95/2005, depending on sludge destination.

Impositions into the contracts (regarding taking or evacuating into the Wastewater sewerage network), signed with divers economical agents, of a condition to include the Wastewater in the conditions from GD 188/2002 – NTPA 002/2002, modified and completed trough GD 352/2005 regarding Wastewater evacuation.

Accomplishing monitoring measures will be set up in their own authorised laboratory, using standardized methods. The results of the self monitoring will be recorded and transmitted to the environmental authorities.

The reporting of the monitored quality indicators are accomplished monthly to Dobrogea Litoral Waters Direction.

The priority substances will be monitored with a biannual frequency, and prior dangerous substances will be monitored with an annual frequency, depending on the obtained results, and from case to case the monitoring frequency can be modified

Monitoring the environment, during the execution period, and also in the Wastewater Treatment Plant operation period will have as purpose to apply the proposed measures from the present report to the Environmental Impact Assessment Study in conditions to generate a minimal impact over the environment, over population and over the localities in a manner to be followed the concept of sustainable development.

5. RISKS SITUATIONS

In the execution period, and also in the operation period of the Project **„Rehabilitation and modernization of water and wastewater supply system in Constanta County– Harsova agglomeration”** is the possibility to appear accidents with a significant environmental impact, generated by the following activities:

- Transportation and manipulation of toxic and dangerous substances as combustibles, chemical substances utilised in the treatment process
- Supplying of the equipment and construction machinery with combustibles
- Losses from fuels storages , where the tanks are not impermeable
- Accidents of construction materials that are transporting toxic or dangerous substances.

6. ACCIDENTS PREVENTION MEASURES

In order to prevent potential accidents resulted as a consequence of the developed activities for the analysed objective, it is necessary to adopt the following measures:

– monitoring the equipment functioning manner, the impermeability of oil and fuel, for transportation vehicles and equipment, storage recipients

– setting up fences, signalising and other warnings to limit working areas.

– to prevent risks of producing pollutions from accidents will be elaborated intervention programs that would foreseen the necessary measurements, teams, intervention endowments and equipments in case of accident.

– verifying the equipment and transportation vehicles before starting works if

these are functioning in optimal parameters and if are not possible defections that could lead to possible combustible losses

- verifying at clocked periods, of electrical installations, of comprised air, oxygen tanks or other explosive, inflammable, toxic or dangerous materials if are functioning at optimal parameters
- immediate action in case of accidents of authorities with ability and take measures to eliminate the pollutants and ecological rebuild of the affected area.
- implementing an emergency call system to ensure the possibility to transmit information characterised like emergencies, as accidents.

7. NECESSARY WORKS TO REHABILITATE THE TEMPORARY UTILISED SURFACES AND ECOLOGICAL REBUILDING OF PERIPHERAL AREAS AFFECTED BY WORKS

Because there are no areas or environmental factors affected were foreseen no ecological reconstruction works.

There are possible minor events in the works execution period in punctual areas, as accidental pollution with fuel from vehicles and equipments, exceed the noise level into the functioning equipment area.

There are foreseen rebuilding works and initial state improving by redoing the vegetal layer.

All works are to be executed under strict supervision of inspectors, and after finishing the construction works will be executed works to rebuild the area and give it beck to the natural circuit, thus:

- demolish the constructions and the structures specific to the construction site organisation
- collecting, reusing and transporting out of the site of the waste resulted from the execution activity
- rebuilding the site in the access, technological roads area and others temporary occupied surfaces by levelling the soil, becoming overgrown with grass and landscaping arrangements by consulting botanists, landscape and horticulture specialists
- rebuilding the vegetal layer immediately after finishing works
- decontaminating the areas that were accidentally polluted with hydrocarbons or other dangerous substances
- testing the soil to decide the level of pollution caused by the construction activity in order to apply measures to lead to give back a satisfactory state to the area

8. CONCLUSIONS AND RECOMMENDATIONS

The Report to the study of impact assessment takes out the causes and consequences of negative and positive effects over the environmental factors caused by implementing the Project „Rehabilitation and modernization of water and wastewater supply system in Constanta County–Mangalia agglomeration”.

When elaborating the present report were considered the following elements:

- Reports, analyses, environmental studies and documents offered by the Beneficiary and by the Designer

- Present legislation regarding the environment protection
- Imposed normative by the local environmental protection authority
- Local Environment Action Plan
- Annual Reports regarding environmental factors state for Constanta County - 2008
- Special literature data, guides, guidance , normative, encyclopaedias

The main aspects regarding the environmental factors pollution are about water, soil, air, human locations pollution and also of degrading the landscape.

Environmental impact assessment was elaborated by considering the numbered criteria from the tables no. 10.1 and no.10.2, being structured by the following fields:

- Alterations over the environment factors
- Effects of alterations of the environment factors upon the population

In the conditions in which the technological proccess and protection measurements are respected, it can be evaluated that the impact of execution and implementation of the project on the environment factors is insignifiant.

From the environmental impact assessment, detailed in this report, results an insignificant and unpersistent effect

By analysing the Project situation in the elaborating process of **ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT**, were underlined the measurements that should be respected by the **Constructor** and **the operator of the water supply and sewerage in Constanta County– Harsova agglomeration**, in the execution period and also in the operation period to be as the environment protection present legislation demands.

It is not the case for supplementary measurements, considered as efficient to minimise the impact.

The Project represents measure with important positive effects upon the environment.

At the end, can be drown a conclusion that negative effects appeared during accomplishing the objective, presented in this report, do not lead to environment factors alteration.

Taking into consideration the results of analysing the Project, it is recommended the approval from the environmental point of view of „Rehabilitation and modernization of water and wastewater supply system in Constanta County–Harsova agglomeration”.

Table 10.1. Alterations of the environmental factors

CRITERIA	EFFECTS ESTIMATION
▪ **negative effects upon the health of the biotope**	▪ insignificant
▪ **warning to rare or in danger species**	▪ rare or in danger species were not defined in the area
▪ **reducing species diversity or perturbing the alimentation chain**	▪ insignificant
▪ **loosing or splitting habitats**	▪ insignificant
▪ **discharging or producing persistent chemical substances, microbiological agents, nutrients, radiations, thermal energy**	▪ not applicable. Discharged Wastewater into the emissary will be treated and will respect the maximal admitted limits by NTPA 001 and the Water Management Permit no. 1221/8.05.2008
▪ **exploiting environmental material resources**	▪ with insignificant effect
▪ **transforming the natural landscape**	▪ with insignificant effect The general impact of the accomplishment of the investment upon the landscape characteristic to the Wastewater Treatment Plant area can be considered as a positive one.
▪ **obstruction of the migration or the passing ways**	▪ with insignificant effect
▪ **negative effects upon the quality or quantity of the biophysical environment (surface waters, underground water, soil, air)**	▪ with insignificant effect Discharged Wastewater into the emissary will be treated and will respect the maximal admitted limits by

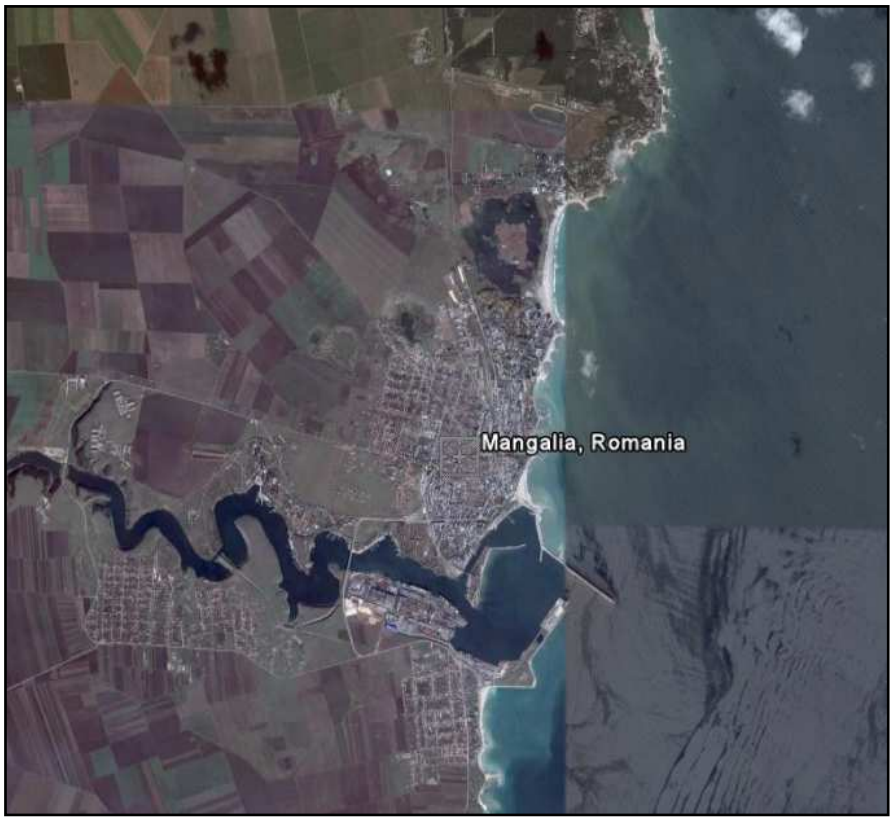
Table 10.2. Effects of the alterations of the environmental factors upon the population

CRITERIA	EFFECTS ESTIMATION
▪ **negative effects upon the human health**	▪ these kind of effects are not marked; can be appreciated that the population comfort level will be increased by accomplishing the investment
▪ **increasing the number of unemployed or economical damage**	▪ positive effects; creating new jobs; offers an increase to the population comfort level
▪ **reducing the quality and the quantity of the recreational capacity**	▪ with insignificant effects; accomplishing the investment can influence positive the possibility for touristic development.
▪ **major alterations in the current utility of the land and of resources in traditional purposes by the local population**	▪ with insignificant effects; rehabilitating the Wastewater Treatment Plant has no necessity for new lands
▪ **negative effects upon the historical, archaeological, paleotological and architectural resources**	▪ insignificant effects, irrelevant for the location of the analysed objective
▪ **reducing the esthetical values or modifying the visual valences**	▪ positive effects; improving the urban scenery during rainy periods
▪ **affecting future utilisations of resources and coastline**	▪ will influence positively the natural resources of the coastline area
▪ **loosing or reducing rare or in danger species, and theirs habitats**	▪ insignificant

MUNICIPAL SERVICES PROJECT - CONSULTING SERVICES FOR
BRAILA, VRANCEA, ILFOV, IALOMITA AND CONSTANTA COUNTIES

ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

„ REHABILITATION AND MODERNIZATION OF WATER AND WASTEWATER SUPPLY SYSTEM IN CONSTANTA -IALOMITA REGION”



NON-TECHNICAL SUMMARY
MANGALIA AGGLOMERATION

Evaluators of the Environmental Impact Assessment Study Report:

SC BIOSYS GROUP SRL

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CONTENT

1. PROJECT DESCRIPTION

The purpose of this investment is to rehabilitate and modernise the sewerage network, as well as the Waste Water Treatment Plant in Mangalia agglomeration.

In accordance with the Town-planning Permit no. 64/11.02.2009, the construction site is located in the construction area of the localities: Mangalia, Saturn, Neptun, Jupiter, Venus, Limanu and non construction area of Mangalia City and Limanu commune. The site is public domain of local interest administrated by territorial administrative units, public domain of the county administrated by Constanta County Council and state public domain under the administration of NA Romanian Waters (Apele Romane) – DADL.

Works that will be accomplished are: sewerage infrastructure works; discharge water treatment works; location in the localities of sewerage pipes.

Sewerage system that serves Mangalia agglomeration is made of:

- domestic water sewerage pipes
- storm water sewerage pipes
- discharge pipes
- 11 waste water Pumping Stations
- Waste Water Treatment Station and Discharge Pipe to the Black Sea

1.1. Project site location

Mangalia City has the following neighbours:

- in the North part, 23 August commune;
- in the East part, Black Sea coastline;
- in the South and South-West parts, Mangalia Lake and Limanu and 2 Mai localities.
- in the de West part Pecineaga and Albeşti communes

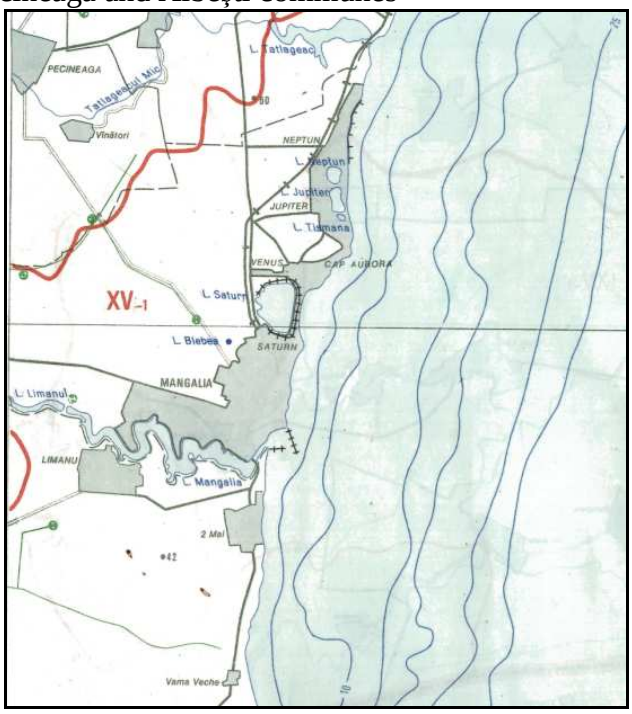


Fig.1 Works location

In this project the following works are proposed:
- Rehabilitation and extension of the sewer network
- Upgrading the Waste Water Treatment Plant

Upgrading the Waste Water Treatment Plant

The existing Waste Water Treatment Plant from Mangalia agglomeration includes mechanical stage, biological stage and sludge treatment stage.
It is necessary an upgrading of the Waste Water Treatment Plant to insure a tertiary treatment, to follow the admitted limits for the treated waste water discharged into the natural body waters, according to NTPA 001/2005.

By introducing the tertiary treatment will be followed:

a) Assumed environmental commitments by Romania through **ACCESSION TREATY TO THE EUROPEAN UNION,** chapter 22 – Environment Protection.

b) Conformation Programme included into the **ENVIRONMENTAL PERMIT** no. 70/09.03.2009, attached to the present documentation.

The proposed process aims to retain the suspension matters (MTS), floating substances, eliminating the biodegradable organic substances (expressed in BOD_5), nitrification, denitrification, phosphorus elimination to be under the foreseen limits.

It is proposed the rehabilitation of the active sludge tanks by increasing their volume by transforming the longitudinal secondary settlement tanks into aeration tanks, introducing biological dephosphorization and a chemical precipitation of phosphorus and rehabilitation of the existing radial secondary settlement tanks, by introducing lamellar blocks.

Site organisation will use the existing locations or mobile caravans for technical personnel and for stock storage.

In order to characterize the waste for the Project „Rehabilitation and modernization of water and wastewater supply system in the region Constanta–Ialomita - Mangalia agglomeration” it is necessary an analysis of these as well for the execution period and for the operation period.

The waste resulted from the investment *execution* activity are represented by:

- Domestic waste
- Technological waste and construction waste
- Connected activities waste

A part of the generated waste from the execution period will be recycled.

The waste resulted from the Waste Water Treatment Plant *operation* activity, are represented by:

- domestic waste
- solid waste retained by grids and sieves
- sludge from the municipal waste water treatment (treatment sludge in case that were stored inside the Waste Water Treatment Plant or existing in different channels, tanks, pipes in rehabilitation)
- waste resulted from sand separator
- solid wastes resulted from grates and screen

2. ENVIRONMENTAL IMPACT ASSESSMENT

2.1. Environmental factor WATER

Constanta county territory is part of two distinct structural, geological and hydro geological separated by a big tectonically fault named „ Capidava – Ovidiu overthrust line”, named after the two localities located at the extreme points:

- north unit of Central Dobrogea
- south unit of South Dobrogea

The hydrographical network is represented by **Black Sea and Mangalia Lake**.

In the vicinity of the proposed investments are: Black Sea and the lakes Mangalia, Saturn, Tismana and Jupiter.

Mangalia Lake is situated in the locality vecinity, having a surface of 2,61 km^2 and a maximum whidth of 13 m. On its margins are sources of sulfurous mezothermal waters. These qualities have determined the creation of balneoclimateric resorts.

Black Sea is the third sea as surface in Europe, after the Mediterranean Sea and North Sea. It is also, the most isolated sea from the planetary ocean – the only connection with the rest of World Ocean, through Mediterranean Sea, being Bosfor – Dardanele, Gibraltar Narrows and with Azov Sea in the north-east, through Kerch Narrow.

The water surface of marine water (until 150 m) sustains the only inhabitants of Black Sea ecosystem.

- The expanse of surface water: 432.000 km^2
- The water volume: 2.212 m
- Salinity: 18- 22%
- Biological species
  - Algae, plants: 1.619
  - Invertebrates: 1.983
  - Fish: 168
  - Martine mammiferous: 4

Romanian seaside

The length of Romanian seaside is 244 km (from the total 4340 km), representing 7,65% from the frontier length. The seaside is divided in two principal sectors: north and south.

Mangalia agglomeration is in the south sector of Romanian seaside (80 kilometres) and it is located between Cape Midia and Vama Veche, being covered by calcareous cliffs by different hights, between 3 and 3.5 m, short sandy beaches sectors at the rivers limits and in ports (Midia, Constanta, Mangalia).

2.1.1. Water pollution sources and pollutions emissions

- **Execution Period**

In the proposed Objective Execution Period the main sources of water pollution are represented by the construction site organization, the equipment and transportation vehicles traffic, works for setting up the investment.

The impact upon the water environmental component in the execution period of the investment is **insignificant and temporary**.

- **Operating Period**

In the investment Operating Period the pollution sources are the following:

- untreated or insufficient treated waste water discharged into the emissary
- petroleum products losses from vehicles that serves the sewerage or auto ways that are in transit.
- losses, in case of damage, from the technological water line and sludge line from the Waste Water Treatment Plant
- accidental pollution caused by loosing the impermeability or defect tanks or sewerage channels connection or defection at the Waste Water Treatment Plant.
- water contamination caused by improper conditions for storage of chemical substances used for water treatment , as well as not to observe hygiene and cleaning conditions.

In case if the technological flux is carefully and strictly followed, the investment won’t produce pollutions to affect the environmental factors: soil, surface and underground waters, the impact being appreciated as **insignificant.**

2.1.2. Water protection measures

- **Execution Period**

To prevent and to control the water pollution in the construction period we are recommending the following measures:

- to avoid discharging into the emissary of waters with a high level of solid suspensions, caused by the construction activity, without a pre settlement of those ones.
- sludge produced by emptying any tank, channel or other existing source will be stored and evacuated in accordance with the present legislation regarding sludge management
- water catchments for constructive necessities will be accomplished only based on issued authorisations by competent authorities
- proper maintenance of utilised machineries to perform the foreseen works in the Project and storage in the foreseen conditions from the present legislation of construction materials and consumables

- any storage tank of combustibles or fuels will be carefully impermeabilizated, supervised and located on a concreted platform, designed with gutters.
- it is forbidden to use asbestos to the executed constructions.
- will be set up sewerage systems, treatment and discharging of storm water that are washing the platform of construction organization site.
- fuels and waste greases will be turned to specialised units

- Operating Period

For water protection in the Waste Water Treatment Plant functioning stage it is necessary to follow the measures:

- insurance of proper maintenance for the Waste Water Treatment Plant
- monitoring water quality at the entrance and at the exit of the Waste Water Treatment Plant and applying measures to decontaminate them before discharging
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals; these will be manipulated by trained personnel, in order to avoid water contamination with such substances measures will be taken
- an Intervention Plan in case of accident will be elaborated
- training the personnel about work conditions and maintaining a high level for hygiene and cleaning standard
- insurance of a strict management for installations functioning , as well for the waste water flow, that could affect the discharged water quality;
- periodic control of the installations and checking of the impermeability, operative defections remediation
- technical state and inside sewerage network functioning control

2.2. Environmental factor AIR

When defining the climatic characteristics of the area there must be taken into account that the area is a contact area of water-dry land where three life environments are overlapping: water, dry land and air that are in a continuous movement, in the context of a temperate continental climate, where is located Black Sea, base for the influences mentioned earlier.

2.2.1. Generated sources and pollutants

- Execution Period

The investment Execution Period from Mangalia agglomeration is characterised by the following pollution sources powder and dust generated be the investment’s rehabilitation and modernization works.

- Emission of these pollutants will be limited in time for this site. Works will be executed on sections that are scheduled successive depending on the execution chart and the rhythm to finalize works.
- machinery and equipments by their functioning in the working fronts area. Machinery and equipments specific activity pollution is appreciated depending on

fuel consume that are generating pollutants like: NOx, SOx, CO, COV_{nm}, aldehydes, hydrocarbons , organic acids, suspension and sedimentables particles

- the traffic to accomplish the investment, traffic specific pollution is appreciate upon fuel consume that generates pollutants as: NOx, CO, COV_{nm}, suspension and sedimentables particles.
- improper maintenance of machinery and equipments
- dust generated by the machinery and equipments traffic and construction materials manipulations
- unpleasant odours generated by the existing sludge evacuation from tank, channel or other existing source, under rehabilitation and modernization works
- improper storage conditions for combustibles utilised to accomplish the construction works

- **Operating Period**

During the investment rehabilitation and modernization works it is appreciate those sources of air pollution stops.

2.2.2. Impact on air

- **Execution Period**

The performed works during the objective execution period have a reduced impact upon the working and neighbourhood area atmosphere quality.

Works for construction site organization will be elaborated and executed correctly, with modern endowments to reduce the emission of noxes in the air, water and on soil. Grouping these into a single site is good by decreasing the impact areas and promotes a controlled and correct operation.

- **Operating Period**

The entire dewatering process is performed mechanic being authorised until the storage phase.

During the treatment technologic process there aren’t produced any gaseous noxes or odours.

Through the adopted technology, the domestic residual waters and sludge resulted are continuous treated being excluded from the anaerobe fermentation area with noxes production as: sulphured hydrogen, methane, carbon dioxide.

The gross retains from the raw water from the automated grids will be transported periodically and are not producers of bad odours.

The sludge is stabilised by aeration and dewatered mechanically through a performant automatic mechanical procedure.

14.1.1 2.2.3. Impact decreasing measures

- **Execution Period**

For air protection during the construction period were proposed the following measures:

- Performing section works, in accordance with execution charts; correlation of works site machinery working charts with those from the production bases.

- Minimising dust and suspension powder emissions resulted from execution works, pipes replacing etc. by applying technologies that are leading to fulfil the demands of STAS 12574-87 regarding atmosphere protection
- Technological machinery will fulfil the requests of GD no. 743/2002 regarding the establishment of approving type procedures of internal combustion motors, intended for mobile off-road machinery and establishing limits for gas and pollutant particles emissions from these
- Performing periodical technical inspections of construction machinery.
- Maintenance and service for machinery and vehicles utilised to reduce the atmosphere pollutants
- The fuel supply of transportation vehicles will be done only in fuel distribution centres.
- Setting up special platforms for materials, machinery and waste storage
- Activities that are producing a lot of dust will be reduced during strong wind periods, or will be done a surface moistening
- Periodical verification of machinery and transportation vehicles regarding the carbon monoxide emission level and others exhaust gases and commissioning only after repairing the possible defections.

- **Operating Period**

For air protection during the operation period were proposed the following measures:

- sewerage and water supply systems, as well as Waste Water Treatment Plant proper operation and maintenance,
- reducing the energy consumption
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals and only by specialised in this field personnel
- the storage of possible inflammable or explosive substances will be done only strictly following the present legislation

2.3. Environmental factor SOIL

2.3.1. Soil and underground pollution sources

- **Execution Period**

During the execution period the potential pollution sources of soil and underground could be:

- traffic of utilised vehicles and heavy machinery generates pollutants from burning combustibles, as well as from machinery functioning into the working fronts.
- accidental fuel, greases, cement, chemical substances or pollutant materials loses during the manipulation and storage;
- improper maintenance and technical defects of machinery, fuel supply, equipment repairing, accidents that may generate combustibles and grease leakages that can lay on soil, leading to structural alteration of soil.

- waste resulted in technological processes and the domestic waste can settle and pollute the soil
- uncontrolled storage and on unarranged spaces of fuels and greases as well as other materials necessary for works execution;
- improper storage of the sludge resulted from the rehabilitation and modernization of the Waste Water Treatment Plant
- sagging soils by heavy construction machinery through the material storage landfills
- taking out of the usual utilisation terrains in order to accomplish the construction site organisation
- untreated or partially treated waste water exfiltrations into soil or underground, caused by replacing pipes works
- untreated waste water discharges on soil or infiltrations into the phreatic layer during the rehabilitation of the Waste Water Treatment Plant

- **Operating Period**

During the operation period the potential sources of pollution for soil and underground are represented by:

- defaults caused by clogged pipes or caused by accidental fissures.
- improper functioning of the Waste Water Treatment Plant can lead to soil pollution.
- untreated or insufficient treated waste water discharged on soil
- untreated or partially treated waste water exfiltrations into soil or underground
- uncontrolled utilisation of sludge on agricultural lands, in the case when this one does not fulfil regarding the quantity, or isn’t applied in the proper quantities according to the present legislation
- storage in improper conditions of chemical substances utilised for water treatment.
- improper storage of technological wastes resulted from the activity of operation and maintenance of the Waste Water Treatment Plant

2.3.2. Impact soil and underground

- **Execution Period**

During this period of time appears a physical impact on soil by performing specific works of the Investment. In accordance, the impact signifies the followings:

- temporary utilizations of fields for construction site organization, technological roads and degrading soils quality
- combustibles losses, greases on soil surface resulted from the parking spaces, fuels supply pumps, accidents could affect significant the soil quality
- technological waste, waste resulted from traffic stored improper on soil surface that can alter the soil quality

- **Operating Period**

Soil pollution can appear as a consequence of improper storage of technological waste resulted from the activity of operation and maintenance of water supply and sewerage system and also of the Waste Water Treatment Plant.

Improper functioning of water supply and sewerage system and also of the Waste Water Treatment Plant can lead to soil pollution.

The waste water transportation pipes cracking can lead to soil and underground water pollution.

2.3.3. Soil and underground protection measurements

- **In Execution Period**

In order to avoid the water and underground pollution, during the execution period are to be performed verifications and any time that it is considered for the utilised machinery

To protect soil and underground against pollution in the Execution Period must be followed many measures, as follows:

- the Constructor must set up a proper construction site organisation taking into consideration the facilities and environmental factors protection by using small surfaces of land
- avoiding using land with superior qualities for construction site organization, machinery bases, temporary or final storages of offsets and construction materials
- interdiction to locate the construction site organization, machinery bases in protected areas or earth sliding areas
- will be avoided soil pollution with fuels, greases resulted from activities as stationery, supplying, storage or fuel supplying of machinery or transportation vehicles or caused by unfitting functioning of these
- any combustible or fuel storage tank will be sealed and supervised and placed on a concreted, designed with leaking gutters
- machinery and vehicles proper parking (on a concreted platform, when this is possible)
- washing and maintenance platform of the equipment must be set up with a sufficient slope to insure the collection of waste water resulted from washing equipment. It is recommended that in the production bases the existence of sealed collection tanks that should be empty periodic
- the selective collection of waste resulted from works execution and the evacuation depending on their nature to storage or to reuse to sanitation services, based on contract, taking into account the EGO no. 16/2001 regarding industrial recycled waste management, approved by Law no. 456/2001 and Law no. 426/2001 regarding waste condition to approve EGO no. 78/2000, with ulterior completions and alterations.
- rational storage of excavation material, in such manner to take small surface areas

- soil recovery (ecological reconstruction) in areas where this was affected trough excavation, material storage equipment stationing, in order to put back into the circuit to the initial utilisation category. When trees are cut down are to be replanted according to the present legislation.
- controlled evacuation of waste water during the accomplishment of the investment, in a manner to avoid the infiltration into the phreatic layer
- sludge from the upgrading the Waste Water Treatment Plant will be managed in accordance with the present legislation
- water catchments for constructive necessities, only based on authorisations issued by competent authorities

- **Operating Period**

In order to protect soil and underground in Operating Period must be followed many measures, thus:

- insurance of proper maintenance of the water supply and sewerage system, and also of Waste Water Treatment Plant
- monitoring sludge quality according to present normative, in order to not affect the agricultural lands quality in case of using it as a fertiliser
- it is forbidden to discharge waste water on soil
- storage in proper conditions (closed spaces designed with concreted platforms, adequate recipients) of chemical substances used in the treatment process
- verifications the impermeability of Investment components objects are to be done periodically.

After finalising works will be accomplished:

- an elimination plan for waste during and at the end of works and cleaning the area after closing the site
- recover the temporary occupied fields and reintegrate them into the initial utilization.

2.4. Geology and geomorphology

— **During the Execution Period**

The groundwater pollution might be due to:

v. storage and handling of hazardous liquids, e.g. oil, fuel or other hazardous chemicals and

vi. compaction and destruction and subsoil stratification by heavy machinery and vehicles, reducing groundwater recharge. The expected negative impacts are considered to be minor, local and temporary.

— **During the Operating Period**

Potential impacts on groundwater are generated by leakages from ruptures of the existing old sewer system as well as from leakages from septic tanks. To a smaller extent, might be a risk the reuse

option of stabilised sewage sludge in agriculture, especially by heavy metals, which might drain into the subsoil and groundwater. This depends on the soil conditions (acidity, solubility of heavy metals), soil structure (adsorption of heavy metals) and permeability. Therefore, the background concentration of the soil and the total sewage sludge load added to the soil has to be monitored.

The proposed priority project by rehabilitating of sewer system will significantly reduce the leakage of raw wastewater into the subsoil and groundwater. The expected impact by proposed replacement of sewer system will be major positive, local, permanent and direct.

This investment represents a principle project objective for the environment protection by eliminating of groundwater pollution by leakage from old and broken sewer systems and elimination the leakage from septic tanks by extension of the sewer system and new connections.

2.5. Biodiversity

2.5.1. General information

In the vicinity of the investment at considerable distances are identified the following Natura 2000 Sites:

- **Special Protection Avifaunistical (SPA)**

ROSPA 0066 –Herghelia Firth

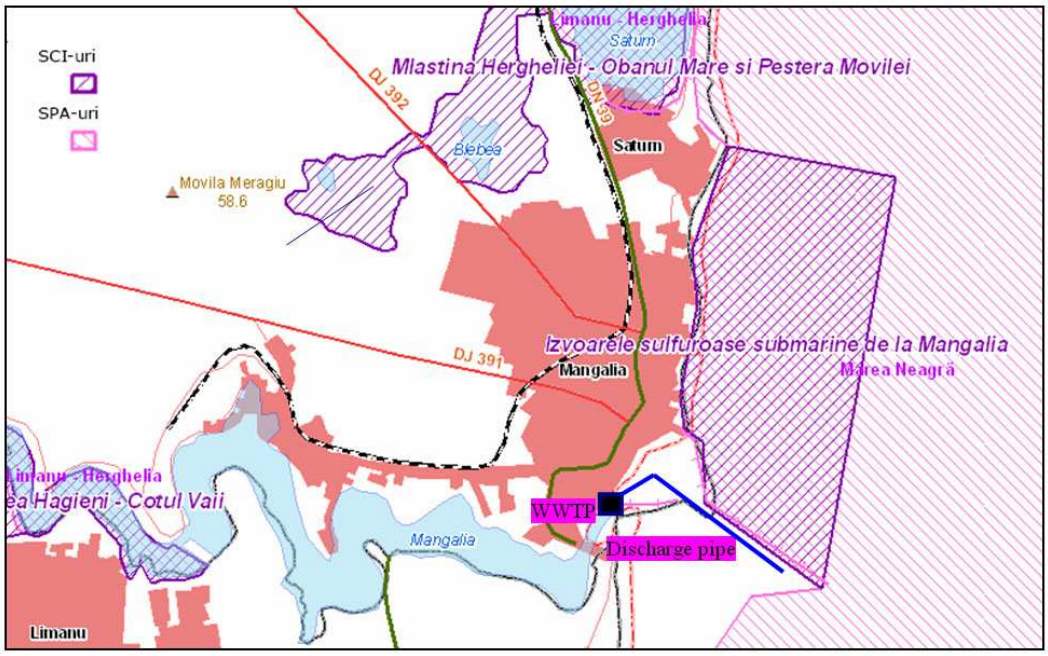
ROSPA 0076 – Black Sea

- **Sites of Comunitary Importance (SCI)**

ROSCI0094 – Mangalia submerse sulphurous spring

ROSCI0114 –Hergheliei Swamp-Obanul Mare and Movilei Cave

ROSCI 0157 –Hagieni – Cotul Vaii Forest



The minimum distance from the discharging pipe to the limit of Natura 2000 site ROSPA 0076 – Black Sea is approx. 50 m.

2.5.2. Pollution sources

It is appreciated that during accomplishing the setting up of designed works and closing working fronts, the biodiversity quality, will come back to the anterior parameters.

Pollution sources, for flora and fauna, during sewerage network and Waste Water Treatment Plant operation period are the following:

- possible networks or Waste Water Treatment Plant defects generating pollutants and noise that may alter the specific to the Investment area flora and fauna
- waste resulted from investment operation maid affect the vegetation from the site

2.5.3. The foreseen impact over the biodiversity

The proposed Project won't produce alterations of forest surfaces, water bodies, swamps, areas or habitats of protected plants species.

Won't have effects upon local fauna, upon birds, mammalians, fishes, or invertebrates populations species.

2.5.4 Impact decrease measures

During investment rehabilitation and modernization period in order to not affect the present environmental impact assessment study area specific biodiversity it is necessary to apply flora and fauna protection **measures**, as:

- construction site organization won't be located on surfaces that are overlapping the communitarian interest sites as well as special avifaunistic protection areas
- respecting the works chart by limiting the lines and working schedule to limit the impact on site specific flora and fauna
- utilising silence equipment and transportation vehicles, to limit the noise caused by the activity of rehabilitation and modernization of sewerage and water supply system as well of the Waste Water Treatment Plant, that runs out animal and birds species, and also endowment with atmosphere pollutants minimisation and retaining performant systems
- setting up physical barriers fencing the construction site organization in order to not affect other surfaces beside those necessary to the investment rehabilitation and modernization and implied to protect the site specific vegetation, and also to avoid accidents.
- avoiding uncontrolled storage of materials resulted from the execution works (vegetation, soil)
- selective collection, reuse and periodic elimination of waste in order to avoid to attract animals or to make them sick or cause accidents.
- prevention and removing road accidents damages that could strongly pollute the area by leakages or fires
- ecological reconstruction of all the affected surfaces when works are finalised and give those back to the initial utilisation.

During the operation are to be set up protection fencing, minimising the impact over the natural habitats and limiting animals access into the site area. Also, to avoid the appearance of diseases or to not allow the vegetation normal development it is necessary a proper maintenance of all the installations from the Waste Water Treatment Plant.

Specific measures to protect the protected areas from the investment vicinity

- closing up to minimum the surfaces taken by construction site organization
- interdiction to locate the construction site organization in the protection area site
- interdiction to cross the protected areas with technological or access roads
- interdiction to locate possible borrowing diggings on protection areas sites
- interdiction to storage the waste resulted in the Execution Period of the Project on protection areas sites
- interdiction to storage the sludge resulted from the Waste Water Treatment Plant or from emptying tanks, channels or other existing structures on protection areas surfaces
- interdiction to set up equipment or transportation vehicles on protected natural area surface
- interdiction to discharge untreated or insufficient treated into the protected sites area
- The creating of new discharging pipes it will be done in the summer season, when are a few birds on the littoral. In these conditions, the impact will be minimum.

In order to minimize the impact on Natura 2000 Site ROSPA 0076 – Black Sea it will be adopted the following alternative solutions:

- The construction of the evacuation pipe into the sea, it will be done only in the summer time, in the period May – August;
- The construction and rehabilitation works will be done only on land, in the period May – August;
- These solutions were imposed because in this period the species of aquatic birds do not nestle, because are disturbed by the tourist activities.

The study on the project's impact on species for which were declared Natura 2000 sites has led to the conclusions in Annex no. XXXVIII to Application Form:

2.6. Landscape

Mangalia City is located in the SE extremity of Romania (Constanța County), situated on the Black Sea coastline, at 20-25 m altitude, l 44 km S of Constanța City.

“Callatis” Archaeology Museum (jars, amorphous, mosaic from a Hellenistic era room, glass recipients, aqueducts fragments, Tanagra statues, basso-relievo, and papyruses). It is an important general interest balneo- climacterics resort, with permanent functioning.

Wellness natural factors are the Black Sea water, chlorate sulphated, sodium, magnesium, sulphurous, chlorate, bicarbonate, sodium, calcium, mezzo thermal (21-280C) mineral waters, from the North part of the City springs, peat coal mud, sulphurous, rich in mineral substances, extracted from a mine situated at north side of the City, and the maritime climate reach in salty aerosols. The resort has a extended beach, with fine sand, and also high cliffs with specific micro climate. The resort is recommended for rheumatic, neurological, central nervous system peripheries etc. affections treatments. The resort has two modern treatment swim pools.

In the north side of the City on 8 km are located balneo climacterics summer resorts: Saturn, Venus, Cap Aurora, Jupiter, Neptun and Olimp, that administrative are part of Mangalia and are connected by busses and mini-cars

Execution of diggings, assembly works of pipes will cause visual impacts on the Black Sea coastline and inside the locality, on the pipes line that could generate generally discomfort to the public, locals and tourists.
Negative impact decreasing measures must comprise adequate measures to inform abaut all planed activities to residents as well as to tourists, including the purpose, time period complexity of works.
During the objective functioning there is no problem regarding landscape being affected, pipes from dry land and from the see are buried.

2.7. Social and economic environment

From the social point of view setting up the investment has positive effects on local’s life quality from Mangalia agglomeration.

Can be appreciate the positive impact over the environment by solving the waste water **insufficient treated** discharged into the emissary, leading to affecting physico-chemical, biological and bacteriological parameters of the Black Sea.

It can be draught the conclusion that setting up the studied objective presents advantages regarding the population comfort level and environmental protection role.

2.8. Cultural and ethnic conditions, cultural patrimony

In the area where the investment is wanted aren’t signalised archaeological values, historical, cultural, architectural that could be affected by the functioning of the water supply and sewerage system, as well as of the Waste Water Treatment Plant.

In case that during construction works takes place an archaeological discovery by chance the works are to be stopped and in maximum 72 hours the Mayor of the locality, where works are performed will be announced.

As in Article 4, paragraph (4) from EO 43/2000 – Ordinance regarding archaeological patrimony protection and declaring archaeological sites as national interest areas with ulterior modifications and alterations, according to its attributions, the Mayor will take the measures foreseen in Article 17 from the mentioned normative.

3. ALTERNATIVES ANALYSIS

3.1 Alternative 0 - Maintaining the present situation

This alternative signifies to ***not accomplish the investment***, that means to not fulfil:

- Assumed environmental commitments by Romania through **ACCESSION TREATY TO THE EUROPEAN UNION,** chapter 22 – Environment Protection.
- Staging Program included into the **WATER MANAGEMENT AUTHORISATION** no. 221/November 2008.

Maintaining the present situation leads to damaging the environment by infiltrations and uncontrolled discharges. The solution to maintain the existing situation can’t be accepted for a balanced development of the area because by setting up an utility infrastructure it is considered necessary a rehabilitation and modernization of the water supply and sewerage system, and also of a new Domestic Waste Water Treatment Plant.

In case of maintaining the present situation there will be no financial efforts but the comfort

level of the population and the environmental conditions are improper for an area in continuous development.

Proposed investments to improve the sewerage system from Mangalia agglomeration are the following:

- sewerage system rehabilitation, more exactly of the main collectors;
- extension of the storm water sewerage system;

Sewerage system rehabilitation will have as effect the diminishing of the number of damages on the network. Will be replaced, first of all, the sections with a high rate of wear where are registered numerous damages.

3.2. Options for sewerage

After a technical-economical analyse were identified two options regarding setting up/rehabilitation of the municipal Waste Water Treatment Plant for water from Mangalia agglomeration, thus:

Option 1 – provision of a single Waste Water Treatment Plant for those four agglomerations Mangalia, Limanu, 2 Mai and Vama Veche by modernization of the existing municipal Waste Water Treatment Plant from Mangalia;

Option 2 – provision of four municipal Waste Water Treatment Plants, by introducing tertiary stage at Mangalia WWTP and construction of new Waste Water Treatment Plants for Limanu, and for 2 Mai and Vama Veche localities, will be in the future with other funds.

SELECTED OPTION

Following an assessment on technical point of view and also financial was selected Option 1 – „Modernization of the Mangalia municipal Waste Water Treatment Plant (WWTP), in order to treat the entire flow of waste water from Mangalia, Limanu, 2 Mai and Vama Veche, by upgrading the secondary settlements tanks”, considering that unites the criteria of an optimal and viable solution for the mentioned systems.

3.3 Sites alternatives

Taking into consideration the studied objective there are no alternatives for the location.

3.4 Designed alternatives

Not applicable. By this Project were imposed and will be respected the present legislation regarding the execution works and also the recommendations for how to operate the water supply and sewerage system, and also the Waste Water Treatment Plant.

Proposed constructive solutions, utilised materials to set up these constructions, volumes regime, regime to develop on horizontal and vertical of investment components, finishes and architectural concept are to ensure a good functionality, a durability and a reliability of equipments and constructions.

It is considered that the chosen solution will offer a high efficiency regarding price-efficiency report and in the same time fulfils the necessary technical conditions.

3.5 Alternatives regarding the execution method

Not applicable.

Were proposed modern execution methods and are to be used best quality materials.

4. MONITORING

During execution the monitoring activity will respect the specific requirements of constructions and installations activities.

In the Project implementation period will be considered the following:

- bringing of affected surfaces to the initial state
- monitoring the degradation of the road system on the routes affected directly (trough execution of diggings, pavement removal) or indirectly (as a consequence of traffic deviation on these roads)
- will be exercise a sever control to concrete transportation with special vehicles, to prevent accidental discharges on the route or throwing cement milk inside the construction site, water courses or public roads
- at the end of the week the working fronts will be cleaned, all waste being eliminated.

When starting operation at the objective will be established a monitoring system – **detailed monitoring plan** with precise measures for the Beneficiary. Will be considered the following:

- monitoring water quality that will be distribute to the consumers
- proper maintenance of the sewerage system
- monitoring water quality at the entrance and exit of the Waste Water Treatment Plant and of effluents, with the established frequency by the competent authority for environmental protection and waters management.
- maintaining the Waste Water Treatment Plant efficiency according to the Project, in a manner to ensure the water treatment according to the present legislation
- proper maintenance of the sewerage system, to avoid disfunctionalities on the evacuation route and waste water treatment
- monitoring the sludge quality in accordance with Ord. 344/2004 or Ord. 95/2005, depending on sludge destination.

Impositions into the contracts (regarding taking or evacuating into the waste water sewerage network), signed with divers economical agents, of a condition to include the waste water in the conditions from GD 188/2002 – NTPA 002/2002, modified and completed trough GD 352/2005 regarding waste water evacuation.

Accomplishing monitoring measures will be set up in their own authorised laboratory, using standardized methods. The results of the self monitoring will be recorded and transmitted to the environmental authorities.

Monitoring the environment, during the execution period, and also in the Waste Water Treatment Plant operation period will have as purpose to apply the proposed measures from the present report to the Environmental Impact Assessment Study in conditions to generate a minimal impact over the environment, over population and over the localities in a manner to be followed the concept of sustainable development .

a. RISKS SITUATIONS

In the execution period, and also in the operation period of the Project **„Rehabilitation and modernization of water and wastewater supply system in Constanta County–Mangalia agglomeration”** is the possibility to appear accidents with a significant environmental impact, generated by the following activities:

– Collecting the sludge from emptying any tank, channel or other existing structure cause of Waste Water Treatment Plant rehabilitation

- Transportation and manipulation of toxic and dangerous substances as combustibles, chemical substances utilised in the treatment process
- Supplying of the equipment and construction machinery with combustibles
- Losses from fuels storages , where the tanks are not impermeable
- Accidents of construction materials that are transporting toxic or dangerous substances.

b. ACCIDENTS PREVENTION MEASURES

In order to prevent potential accidents resulted as a consequence of the developed activities for the analysed objective, it is necessary to adopt the following measures:

- monitoring the equipment functioning manner, the impermeability of oil and fuel, for transportation vehicles and equipment, storage recipients
- setting up fences, signalising and other warnings to limit working areas.
- to prevent risks of producing pollutions from accidents will be elaborated intervention programs that would foreseen the necessary measurements, teams, intervention endowments and equipments in case of accident.
- verifying the equipment and transportation vehicles before starting works if these are functioning in optimal parameters and if are not possible defections that could lead to possible combustible losses
- verifying at clocked periods, of electrical installations, of comprised air, oxygen tanks or other explosive, inflammable, toxic or dangerous materials if are functioning at optimal parameters
- immediate action in case of accidents of authorities with ability and take measures to eliminate the pollutants and ecological rebuild of the affected area.
- implementing an emergency call system to ensure the possibility to transmit information characterised like emergencies, as accidents.

c. NECESSARY WORKS TO REHABILITATE THE TEMPORARY UTILISED SURFACES AND ECOLOGICAL REBUILDING OF PERIPHERAL AREAS AFFECTED BY WORKS

Because there are no areas or environmental factors affected were foreseen no ecological reconstruction works.

There are possible minor events in the works execution period in punctual areas, as accidental pollution with fuel from vehicles and equipments, exceed the noise level into the functioning equipment area.

There are foreseen rebuilding works and initial state improving by redoing the vegetal layer.

All works are to be executed under strict supervision of inspectors, and after finishing the construction works will be executed works to rebuild the area and give it beck to the natural circuit, thus:

- demolish the constructions and the structures specific to the construction site organisation

- collecting, reusing and transporting out of the site of the waste resulted from the execution activity
- rebuilding the site in the access, technological roads area and others temporary occupied surfaces by levelling the soil, becoming overgrown with grass and landscaping arrangements by consulting botanists, landscape and horticulture specialists
- rebuilding the vegetal layer immediately after finishing works
- decontaminating the areas that were accidentally polluted with hydrocarbons or other dangerous substances
- testing the soil to decide the level of pollution caused by the construction activity in order to apply measures to lead to give back a satisfactory state to the area

d. CONCLUSIONS AND RECOMMENDATIONS

The Report to the study of impact assessment takes out the causes and consequences of negative and positive effects over the environmental factors caused by implementing the Project „Rehabilitation and modernization of water and wastewater supply system in Constanta County–Mangalia agglomeration”.

When elaborating the present report were considered the following elements:

- Reports, analyses, environmental studies and documents offered by the Beneficiary and by the Designer
- Present legislation regarding the environment protection
- Imposed normative by the local environmental protection authority
- Local Environment Action Plan
- Annual Reports regarding environmental factors state for Constanta County - 2008
- Special literature data, guides, guidance , normative, encyclopaedias

The main aspects regarding the environmental factors pollution are about water, soil, air, human locations pollution and also of degrading the landscape.

Environmental impact assessment was elaborated by considering the numbered criteria from the following tables, being structured by the following fields:

- Alterations over the environment factors
- Effects of alterations of the environment factors upon the population

The principal aspects regarding environment factors reffers to the pollution of water, soil, air, human settlements and also to the landscape degradation.

In the conditions in which the technological proccess and protection measurements are respected, it can be evaluated that the impact of execution and implementation of the project on the environment factors is insignifiant.

In the conditions of corect administration of the materials used to improve the water supply system and sewer system from Mangalia agglomeration, the quality of the air it doesn`t change.

If the necessary protection measure are taken into consideration, the execution activities and implementing of the project won`t have a potential polluting impact on the soil and subsoil.

The general impact on tjhe human settlements and on public objectives is low and compared with the actual situation, it will be positive.

By analysing the Project situation in the elaborating process of **ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT**, were underlined the measurements that should be respected by the **Constructor** and **the operator of the water supply and sewerage in Constanta County–Mangalia agglomeration**, in the execution period and also in the operation period to be as the environment protection present legislation demands.

It is not the case for supplementary measurements, considered as efficient to minimise the impact.

The Project represents measure with important positive effects upon the environment.

At the end, can be drown a conclusion that negative effects appeared during accomplishing the objective, presented in this report, do not lead to environment factors alteration.

Table 10.1. Alterations of the environmental factors

ALTERATIONS OF ENVIRONMENT FACTORS	
CRITERIA	**EFFECTS ESTIMATION**
▪ **negative effects upon the health of the biotope**	▪ insignificant
▪ **warning to rare or in danger species**	▪ rare or in danger species were not defined in the area
▪ **reducing species diversity or perturbing the alimentation chain**	▪ insignificant
▪ **loosing or splitting habitats**	▪ insignificant
▪ **discharging or producing persistent chemical substances, microbiological agents, nutrients, radiations, thermal energy**	▪ not applicable. Discharged waste water into the emissary will be treated and will respect the maximal admitted limits by NTPA 001 and the Water Management Permit no. 1221/8.05.2008
▪ **exploiting environmental material resources**	▪ with insignificant effect
▪ **transforming the natural landscape**	▪ with insignificant effect The general impact of the accomplishment of the investment upon the landscape characteristic to the Waste water Treatment Plant area can be considered as a positive one.
▪ **obstruction of the migration or the passing ways**	▪ with insignificant effect
▪ **negative effects upon the quality or quantity of the biophysical environment**	▪ with insignificant effect Discharged waste water into the emissary will be

(surface waters, underground water, soil, air)	treated and will respect the maximal admitted limits by

Table 10.2. Effects of the alterations of the environmental factors upon the population

EFFECTS OF ENVIRONMENT ALTERATIONS UPON THE POPULATION	
CRITERIA	**EFFECTS ESTIMATION**
▪ **negative effects upon the human health**	▪ these kind of effects are not marked; can be appreciated that the population comfort level will be increased by accomplishing the investment
▪ **increasing the number of unemployed or economical damage**	▪ positive effects; creating new jobs; offers an increase to the population comfort level
▪ **reducing the quality and the quantity of the recreational capacity**	▪ with insignificant effects; accomplishing the investment can influence positive the possibility for touristic development.
▪ **major alterations in the current utility of the land and of resources in traditional purposes by the local population**	▪ with insignificant effects; rehabilitating the Waste Water Treatment Plant has no necessity for new lands
▪ **negative effects upon the historical, archaeological, paleotological and architectural resources**	▪ insignificant effects, irrelevant for the location of the analysed objective
▪ **reducing the esthetical values or modifying the visual valences**	▪ positive effects; improving the urban scenery during rainy periods
▪ **affecting future utilisations of resources and coastline**	▪ will influence positively the natural resources of the coastline area
▪ **loosing or reducing rare or in danger species, and theirs habitats**	▪ insignificant

MUNICIPAL SERVICES PROJECT - CONSULTING SERVICES FOR

BRAILA, VRANCEA, ILFOV, IALOMITA AND CONSTANTA COUNTIES

ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT

„REHABILITATION AND MODERNIZATION OF WATER AND WASTEWATER SUPPLY SYSTEM IN CONSTANTA AND IALOMITA REGION”

NON-TECHNICAL SUMMARY

FIERBINTI – DRIDU AGGLOMERATION

Evaluators of the Environmental Impact Assessment Study Report:

SC BIOSYS GROUP SRL

Ecology Counsellor	**Gabriel BANICA**
Main Evaluator Expert	**Mihaela ISPAS**
Main Evaluator Expert	**Marina DINU**

CONTENT

1. PROJECT DESCRIPTION

The purpose of this investment is to rehabilitate and modernise the water supply system and sewerage from Fierbinti – Dridu agglomeration.

In accordance with the Town-planning Permits no. 54/28.04.2009 and no. 84/29.09.2008, the construction sites are located in the construction area and outside the construction area of Fierbinti -Targ and Dridu localities being public domain of the localities administrated by Local Councils.

From an economical point of view, the site is located in the constructible perimeter of the localities and has the following utilisation categories: streets – sites where will be set up public networks and construction field –sites where will be constructed pumping stations, wastewater treatment plant and boreholes.

The site has access to communication networks, for vehicles and humans. The site can be connected to water supply and sewerage networks, electrical power and phones that already exist in the area.

1.1. Project site location

Project foreseen works are located on the territory of Fierbinti and Dridu localities, Ialomita County. Fierbinti locality is located at the west border of Ialomita County, at 44° 7' on a side and on the other side of Dridu Storage Lake and has the following neighbours:

- at north Brazii commune
- at west, Dridu commune
- at south, Movilita commune
- at east, Ilfov County boundary

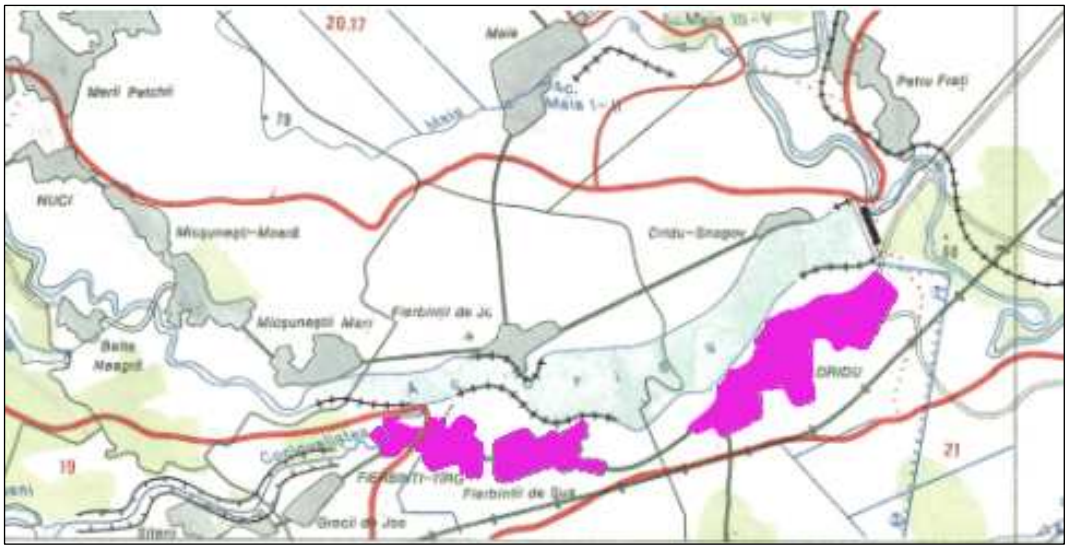


Fig.1 Works location

1.2. Technological processes

The foreseen works for the water supply system

Fierbinti-Targ Locality

- **Extension of water supply network**

Dridu Locality

- **Extension of the catchments**
- **Extension of the Water Main**
- **Setting up a storage tank**
- **Extension of distribution water network**
- **Setting up sewerage networks**
- **Setting up pumping stations**
- **Setting up a Waste Water Treatment Plant**

The Waste Waster Treatment Plant proposed with classical technology will ensure the separation and removal of no purifying elements contained by the wastewater, bringing them into the limits for discharging into the water body recipients, according to NTPA 001/2005 for localities under 10,000 inhabitants.

The dimensioning calculation for the Waste Water Treatment Plant is presented in the Calculation Documentation. The starting calculation data for the maximum capacity is based on the number of population equivalent of 9265, equivalent population from Fierbinti-Targ and Dridu localities.

The treatment scheme complies to the wastewater characteristic flows, to the pollutions indicators concentration sand aims to retain suspension matters (MTS), floating maters, to eliminate the organically biodegradable substances (noted as BOD_5), nitrification, denitrification and aerobe sludge stabilization.

Site organisation will use the existing locations or mobile caravans for technical personnel and for stock storage.

In order to characterize the waste for the Project **„Rehabilitation and modernization of water and wastewater supply system in Constanta and Ialomita region– Fierbinti - Dridu agglomeration”** it is necessary an analyse of these as well for the execution period and for the operation period

The waste resulted from the investment *execution* activity are represented by:

- Domestic waste
- Technological waste and construction waste
- Connected activities waste

A part of the generated waste from the execution period will be recycled.

The waste resulted from the Waste Water Treatment Plant *operation* activity, are represented by:

- domestic waste
- solid waste retained by grids and sieves
- sludge from the municipal waste water treatment (treatment sludge in case that were stored inside the Waste Water Treatment Plant or existing in different channels, tanks, pipes in rehabilitation)
- waste resulted from sand separator
- solid wastes retained on grates and screen

2. Environmental Impact Assessment

2.1. Environmental factor WATER

Surface water sources from Ialomita County are presented in the sectors of hydrographical areas of the administrative territory of the Danube River (Borcea branch), Ialomita and Prahova rivers, and also in many existing lakes. Fierbinti and Dridu localities are located in the Ialomita River hydrographical area.

The main surface water resourses presents the following charactestics:

- Dunarea River (Borcea Branch) in this section the river presents one inferior terrace of 35-38 m between the localities Bordusani and Vladeni and one superior terrace between the localities Fetesti and Facaeni; the water is inluded in first quality water class, according to the Local Environemental Action Plan of Ialomita County Council.
- Ialomita river is crossing from west to east side of the Ialomita County, with a total lenght of approx.212 km, until its influx in Dunarea River (Borcea Branch) upstream from Giurgeni;
- Amara and Fundata Lakes, situated in the crowded urban sectors Slobozia and Fundata, have water surface resources very strong mineralizated, exploatated in therapeutical purposes.
- Dridu Lake is situated on the course of Ialonita river, upstream with the confluence with Prahova river, in the area of the locality Fierbinti – Dridu, has a surface of 996 hectars and a total volume of 21 milion cubic meters; the quality of this water is included in the Second surface water quality. The Lake is under an eutrophisation process and has multiple utilisations (agriculture, pisciculture)
- More, there are multiple natural lakes and accumulation lakes , with lower surface and volume, that are used fro agriculture and pisciculture.

2.1.1. Water pollution sources and pollutions emissions

➢ Execution Period

In the proposed Objective Execution Period the main sources of water pollution are represented by the construction site organization, the equipment and transportation vehicles traffic, works for setting up the investment.

The impact upon the water environmental component in the execution period of the investment is **insignificant and temporary**.

➢ Operating Period

In the investment Operating Period the pollution sources are the following:

- untreated or insufficient treated waste water discharged into the recipient body water;
- petroleum products losses from vehicles that serves the sewerage or auto ways that are in transit;
- losses, in case of damage, from the technological water line and sludge line from the Waste Water Treatment Plant;
- accidental pollution caused by loosing the impermeability or defect tanks or sewerage channels connection or defection at the Waste Water Treatment Plant;
- water contamination caused by improper conditions for storage of chemical substances used for water treatment , as well as not to observe hygiene and cleaning conditions;

In case if the technological flux is carefully and strictly followed, the investment won't produce pollutions to affect the environmental factors: soil, surface and underground waters, the impact being appreciated as **insignificant.**

2.1.2. Water protection measures

➢ **Execution Period**

To prevent and to control the water pollution in the construction period we are recommending the following measures:

- to avoid discharging into the emissary of waters with a high level of solid suspensions, caused by the construction activity, without a pre settlement of those ones.
- water catchments for constructive necessities will be accomplished only based on issued authorisations by competent authorities
- proper maintenance of utilised machineries to perform the foreseen works in the Project and storage in the foreseen conditions from the present legislation of construction materials and consumables
- any storage tank of combustibles or fuels will be carefully impermeabilizated, supervised and located on a concreted platform, designed with gutters.
- it is forbidden to use asbestos to the executed constructions.
- will be set up sewerage systems, treatment and discharging of storm water that are washing the platform of construction organization site.
- fuels and waste greases will be turned to specialised units

➢ **Operating Period**

For water protection in the Waste Water Treatment Plant functioning stage it is necessary to follow the measures:

- insurance of proper maintenance for the Waste Water Treatment Plant
- monitoring water quality at the entrance and at the exit of the Waste Water Treatment Plant and applying measures to decontaminate them before discharging
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals; these will be manipulated by trained personnel, in order to avoid water contamination with such substances measures will be taken
- an Intervention Plan in case of accident will be elaborated
- training the personnel about work conditions and maintaining a high level for hygiene and cleaning standard
- insurance of a strict management for installations functioning , as well for the waste water flow, that could affect the discharged water quality;
- periodic control of the installations and checking of the impermeability, operative defections remediation
- technical state and inside sewerage network functioning control

2.2. Environmental factor AIR

The climate is temperate-continental characterised through very hot summers and very cold winters, through an important day/night annual thermal amplitude and through reduce quantities of precipitations.

2.2.1. Generated sources and pollutants

➢ **Execution Period**

The Execution Period of the investment from Fierbinti-Dridu agglomeration is characterised

by the following pollution sources:

- powder and dust generated be the investment's rehabilitation and modernization works. Emission of these pollutants will be limited in time for this site, works will be executed on sections that are scheduled successive depending on the execution chart and the rhythm to finalize works.
- machinery and equipments by their functioning in the working fronts area. Machinery and equipments specific activity pollution is appreciated depending on fuel consume that are generating pollutants like: NOx, SOx, CO, COV_{nm}, aldehydes, hydrocarbons , organic acids, suspension and sedimentables particles
- the traffic to accomplish the investment, traffic specific pollution is appreciate upon fuel consume that generates pollutants as: NOx, CO, COV_{nm}, suspension and sedimentables particles.
- improper maintenance of machinery and equipments
- dust generated by the machinery and equipments traffic and construction materials manipulations
- unpleasant odours generated by the existing sludge evacuation from tank, channel or other existing source, under rehabilitation works
- improper storage conditions for combustibles utilised to accomplish the construction works

➢ **Operating Period**

During the investment rehabilitation and modernization works it is appreciate those sources of air pollution stops.

2.2.2. Impact on air

➢ **During the Execution Period**

The performed works during the objective execution period have a reduced impact upon the working and neighbourhood area atmosphere quality.

Works for construction site organization will be elaborated and executed correctly, with modern endowments to reduce the emission of noxes in the air, water and on soil. Grouping these into a single site is good by decreasing the impact areas and promotes a controlled and correct operation.

➢ **During the Operating Period**

The entire dewatering process is performed mechanic being automatic. During the treatment technologic process there aren't produced any gaseous noxes or odours.

Through the adopted technology, the domestic residual waters and sludge resulted are continuous treated being excluded from the anaerobe fermentation area with noxes production as: sulphured hydrogen, methane, carbon dioxide.

The gross retains from the raw water from the automated grids will be transported periodically and are not producers of bad odours.

The sludge is stabilised by aeration and dewatered mechanically through a performant automatic mechanical procedure.

2.2.3. Impact decreasing measures

➢ **During the Execution Period**

For air protection during the construction period were proposed the following measures:

- Performing section works, in accordance with execution charts; correlation of works site machinery working charts with those from the production bases.
- Minimising dust and suspension powder emissions resulted from execution works, pipes replacing etc. by applying technologies that are leading to fulfil the demands of STAS 12574-87 regarding atmosphere protection
- Technological machinery will fulfil the requests of GD no. 743/2002 regarding the establishment of approving type procedures of internal combustion motors, intended for mobile off-road machinery and establishing limits for gas and pollutant particles emissions from these
- Performing periodical technical inspections of construction machinery.
- Maintenance and service for machinery and vehicles utilised to reduce the atmosphere pollutants
- The fuel supply of transportation vehicles will be done only in fuel distribution centres.
- Setting up special platforms for materials, machinery and waste storage
- Activities that are producing a lot of dust will be reduced during strong wind periods, or will be done a surface moistening
- Periodical verification of machinery and transportation vehicles regarding the carbon monoxide emission level and others exhaust gases and commissioning only after repairing the possible defections.

➢ **During the Operating Period**

For air protection during the operation period were proposed the following measures:

- sewerage and water supply systems, as well as Waste Water Treatment Plant proper operation and maintenance,
- reducing the energy consumption
- the utilisation of toxic substances will be done only after the obtainment of the necessary approvals and only by specialised in this field personnel
- the storage of possible inflammable or explosive substances will be done only strictly following the present legislation

2.3. Environmental factor SOIL

2.3.1. Soil and underground pollution sources

➢ **During the Execution Period**

During the execution period the potential pollution sources of soil and underground could be:

- traffic of utilised vehicles and heavy machinery generates pollutants from burning combustibles, as well as from machinery functioning into the working fronts
- accidental fuel, greases, cement, chemical substances or pollutant materials loses during the manipulation and storage;
- improper maintenance and technical defects of machinery, fuel supply, equipment repairing, accidents that may generate combustibles and grease leakages that can lay on soil, leading to structural alteration of soil.
- waste resulted in technological processes and the domestic waste can settle and pollute the soil
- uncontrolled storage and on unarranged spaces of fuels and greases as well as other materials necessary for works execution;
- improper storage of the sludge resulted from the rehabilitation and modernization of the Waste Water Treatment Plant

- sagging soils by heavy construction machinery through the material storage landfills
- taking out of the usual utilisation terrains in order to accomplish the construction site organisation
- the excavations executed for the new boreholes or to replace or set up new pipes
- untreated or partially treated waste water exfiltrations into soil or underground, caused by replacing pipes works
- untreated waste water discharges on soil or infiltrations into the phreatic layer during the rehabilitation of the Waste Water Treatment Plant

➢ **During the Operating Period**

During the operation period the potential sources of pollution for soil and underground are represented by:

- defaults caused by clogged pipes or caused by accidental fissures.
- improper functioning of the Waste Water Treatment Plant can lead to soil pollution.
- untreated or insufficient treated waste water discharged on soil
- untreated or partially treated waste water exfiltrations into soil or underground
- uncontrolled utilisation of sludge on agricultural lands, in the case when this one does not fulfil regarding the quantity, or isn’t applied in the proper quantities according to the present legislation
- storage in improper conditions of chemical substances utilised for water treatment.
- improper storage of technological wastes resulted from the activity of operation and maintenance of the Waste Water Treatment Plant

2.3.2. Impact on soil and underground

➢ **During the Execution Period**

During this period of time appears a physical impact on soil by performing specific works of the Investment. In accordance, the impact signifies the followings:

- temporary utilizations of fields for construction site organization, technological roads and degrading soils quality
- combustibles losses, greases on soil surface resulted from the parking spaces, fuels supply pumps, accidents could affect significant the soil quality
- technological waste, waste resulted from traffic stored improper on soil surface that can alter the soil quality

➢ **During the Operating Period**

Soil pollution can appear as a consequence of improper storage of technological waste resulted from the activity of operation and maintenance of water supply and sewerage system and also of the Waste Water Treatment Plant.

Improper functioning of the investment can lead to soil pollution.

The waste water transportation pipes cracking can lead to soil and underground water pollution.

2.3.3. Soil and underground protection measurements

➢ **During the Execution Period**

In order to avoid the water and underground pollution, during the execution period are to be performed verifications and any time that it is considered for the utilized machinery

To protect soil and underground against pollution in the Execution Period must be followed many measures, as follows:

- the Constructor must set up a proper construction site organisation taking into consideration the facilities and environmental factors protection by using small surfaces of land
- avoiding using land with superior qualities for construction site organization, machinery bases, temporary or final storages of offsets and construction materials
- interdiction to locate the construction site organization, machinery bases in protected areas or earth sliding areas
- will be avoided soil pollution with fuels, greases resulted from activities as stationery, supplying, storage or fuel supplying of machinery or transportation vehicles or caused by unfitting functioning of these
- any combustible or fuel storage tank will be sealed and supervised and placed on a concreted, designed with leaking gutters
- machinery and vehicles proper parking (on a concreted platform, when this is possible)
- washing and maintenance platform of the equipment must be set up with a sufficient slope to insure the collection of waste water resulted from washing equipment. It is recommended that in the production bases the existence of sealed collection tanks that should be empty periodic
- the selective collection of waste resulted from works execution and the evacuation depending on their nature to storage or to reuse to sanitation services, based on contract, taking into account the EGO no. 16/2001 regarding industrial recycled waste management, approved by Law no. 456/2001 and Law no. 426/2001 regarding waste condition to approve EGO no. 78/2000, with ulterior completions and alterations.
- rational storage of excavation material, in such manner to take small surface areas
- soil recovery (ecological reconstruction) in areas where this was affected trough excavation, material storage equipment stationing, in order to put back into the circuit to the initial utilisation category. When trees are cut down are to be replanted according to the present legislation.
- controlled evacuation of waste water during the accomplishment of the investment, in a manner to avoid the infiltration into the phreatic layer
- water catchments for constructive necessities, only based on authorisations issued by competent authorities

Tender Dossier will comprise specific measurements for management of waste produced on the site, to avoid soil pollution.

- **During the Operating Period**

In order to protect soil and underground in Operating Period must be followed many measures, thus:

- insurance of proper maintenance of the water supply and sewerage system, and also of Waste Water Treatment Plant
- monitoring sludge quality according to present normative, in order to not affect the agricultural lands quality in case of using it as a fertiliser
- it is forbidden to discharge waste water on soil

- storage in proper conditions (closed spaces designed with concreted platforms, adequate recipients) of chemical substances used in the treatment process
- verifications the of water supply and sewerage systems and of Waste Water Treatment Plant impermeability and components objects are to be done periodically.

After finalising works will be accomplished:

- an elimination plan for waste during and at the end of works and cleaning the area after closing the site
- recover the temporary occupied fields and reintegrate them into the initial utilization.

2.4. Geology of the underground and geomorphology

- **During the Execution Period**

The groundwater pollution might be due to:

vii. storage and handling of hazardous liquids (e.g. oil, fuel or other hazardous chemicals)

viii. compaction and destruction and subsoil stratification by heavy machinery and vehicles, reducing groundwater recharge.

The expected negative impacts are considered to be minor, local and temporary.

- **During the Operating Period**

Potential impact on groundwater is generated by leakages from ruptures of the existing old sewer system as well as from leakages from septic tanks.

To a smaller extent, might be a risk the reuse option of stabilised sewage sludge in agriculture, especially by heavy metals, which might drain into the subsoil and groundwater. This depends on the soil conditions (acidity, solubility of heavy metals), soil structure (adsorption of heavy metals) and permeability. Therefore, the background concentration of the soil and the total sewage sludge load added to the soil has to be monitored.

The proposed priority project by rehabilitating of sewer system will significantly reduce the leakage of raw wastewater into the subsoil and groundwater. The expected impact by proposed replacement of sewer system will be **major positive**, local, permanent and direct.

This investment represents a principle project objective for the environment protection by eliminating of groundwater pollution by leakage from old and broken sewer systems and elimination the leakage from septic tanks by extension of the sewer system and new connections.

2.5. Biodiversity

2.5.1. Protected areas from the vicinity of the investments

Protected natural areas that are part of Natura 2000 ecologic network from Ialomita County territory are located at relative big distances of the proposed investment, in order for the Project not to affect habitats and species for that were designated these protected areas.

The most important natural protected area from the area, is the Special Protection Avifaunistical (SPA), part of the Ecological European Network Natura 2000: RO SPA 0044 – Gradistea-Caldarusani-Dridu.

The protected area lays towards west, exceeds a lot our interest area. Only the east part, Dridu Storage Lake, is in the vicinity of the two localities where will be performed water supply and sewerage networks activities, Fierbinti Targ and Dridu.

The minimum distance from the proposed investments and the limit of Natura 2000 site RO

SPA 0044 – Grădiştea-Căldăruşani-Dridu is approximate of 600 m.

The direct impact over the biodiversity

The proposed Project won’t lead to alterations of some forested surfaces, water bodies, swamps, areas or habitats of species of protected plants. Won’t have effects over the local flora, over the birds species populations, mammalians, fishes or invertebrates.

Aquatic avifauna, important from the preservation point of view, can’t be affected by the works that will take place in these two localities.

2.5.2. Pollution sources

It is appreciated that during accomplishing the setting up of designed works and closing working fronts, the biodiversity quality, will come back to the anterior parameters.

Pollution sources, for flora and fauna, during sewerage network and Waste Water Treatment Plant operation period are the following:

- possible networks or Waste Water Treatment Plant defects generating pollutants and noise that may alter the specific to the Investment area flora and fauna
- waste resulted from investment operation maid affect the vegetation from the site

14.1.2 3.5.3. Forecast of impact on biodiversity

The proposed project will not produce any changes on forest areas, water body, swamp, protected species of plants areas or habitats.
The proposed project will not have effects on local flora, on birds populations, mammiferous, fish or invertebrates.

14.1.3 3.5.4Impact decrease measures

During investment setting up in order to not affect the present environmental impact assessment study area specific biodiversity it is necessary to apply flora and fauna protection measures, as:

- construction site organization won’t be located on surfaces that are overlapping the communitarian interest sites as well as special avifaunistic protection areas
- respecting the works chart by limiting the lines and working schedule to limit the impact on site specific flora and fauna
- utilizing silence equipment and transportation vehicles, to limit the noise caused by the activity of rehabilitation and modernization of sewerage and water supply system as well of the Waste Water Treatment Plant, that runs out animal and birds species, and also endowment with atmosphere pollutants minimization and retaining performant systems
- setting up physical barriers fencing the construction site organization in order to not affect other surfaces beside those necessary to the investment rehabilitation and modernization and implied to protect the site specific vegetation, and also to avoid accidents.
- avoiding uncontrolled storage of materials resulted from the execution works (vegetation, soil)
- selective collection, reuse and periodic elimination of waste in order to avoid to attract animals or to make them sick or cause accidents.
- prevention and removing road accidents damages that could strongly pollute the area by leakages or fires

- ecological reconstruction of all the affected surfaces when works are finalized and give those back to the initial utilization.

During the operation are to be set up protection fencing, minimizing the impact over the natural habitats and limiting animals access into the site area. Also, to avoid the appearance of diseases or to not allow the vegetation normal development it is necessary a proper maintenance of all the installations from the Waste Water Treatment Plant.

Specific measures to protect the protected areas from the investment vicinity:

- closing up to minimum the surfaces taken by construction site organization
- interdiction to locate the construction site organization in the protection area site
- interdiction to cross the protected areas with technological or access roads
- interdiction to locate possible borrowing diggings on protection areas sites
- interdiction to storage the waste resulted in the Execution Period of the Project on protection areas sites
- interdiction to storage the sludge resulted from the Waste Water Treatment Plant or from emptying tanks, channels or other existing structures on protection areas surfaces
- interdiction to set up equipment or transportation vehicles on protected natural area surface
- interdiction to discharge untreated or insufficient treated into the protected sites area
- interdiction to set up equipment or transportation vehicles on protected natural area surface
- interdiction to discharge untreated or insufficient treated into the protected sites area
- staff and the personnel that will be working to set up the investments will be warned about the importance that this area has in order to protect the nature.

2.6. Landscape

Works foreseen in the Project are located on the territory of Fierbinti and Dridu localities, Ialomita County.

Setting up the investments does not present any functional or other nature elements that could damage the natural and the existent constructed environment

The free territory from the designed constructed area, that won’t be arranged as concreted platforms, roads, parking will be arranged as green spaces with protection and ambiental role.

The green spaces are representing an important percentage from the total fenced surface and arranged from the construction that will be set up.

Inside the Waste Water Treatment Plant were proposed in this Project green spaces arranging works using a variety of trees, bushes and decorative plants.

Performing diggings, mountings of pipes works will cause visual impacts inside the locality, on the pipes course that could generate a discomfort generally to the locals. Decreasing measures of the negative impact must comprise adequate informing measures over all planned activities towards the residents and also to tourists, including the purpose, time period and works surface. During the objective functioning period the landscape can’t be affected, the pipes from the dry land and from under water being buried.

2.7. Social and economic environment

From the social point of view setting up the investment has positive effects on the life quality of the local population from Harsova agglomeration.

Can be appreciate the positive impact over the environment by solving the waste water **insufficient treated** discharged into the emissary, leading to affecting physico-chemical, biological and bacteriological parameters of Danube.

It can be draught the conclusion that setting up the studied objective presents advantages regarding the population comfort level and environmental protection role.

2.8. Cultural and ethnic conditions, cultural patrimony

In the area where the investment is wanted aren’t signalised archaeological values, historical, cultural, and architectural that could be affected by the functioning of the water supply and sewerage system.

In case that during construction works takes place an archaeological discovery by chance the works are to be stopped and in maximum 72 hours the Mayor of the locality, where works are performed will be announced.

As in Article 4, paragraph (4) from EO 43/2000 – Ordinance regarding archaeological patrimony protection and declaring archaeological sites as national interest areas with ulterior modifications and alterations, according to its attributions, the Mayor will take the measures foreseen in Article 17 from the mentioned normative.

3. Alternatives analysis

3.1. Alternative 0 - Maintaining the present situation

This alternative signifies to ***not accomplish the investment*** that means to not fulfil the assumed environmental commitments by Romania through **ACCESSION TREATY TO THE EUROPEAN UNION,** chapter 22 – Environment Protection.

Maintaining the current situation will lead to environment deterioration by infiltrations and uncontrolled discharging. The solution to maintain the current situation can’t be accepted for a balanced development of the area because by setting up a public infrastructure it is considered necessary to rehabilitate and modernize the sewerage, as well as to set up a Waste Water Treatment Plant.

In case of maintaining the current situation there won’t be any financial effort but the population comfort level and the environmental conditions are improper for an area that suffers a continuous development.

After the options analyses were identified the most proper solutions in order to improve the sewerage in accordance with the Project objectives:

- **Option 1 –** Setting up a single Waste Water Treatment Plant for the two localities, Fierbinti and Dridu, by building a new Domestic Waste Water Treatment Plant (WWTP) at la Fierbinti.
- **Option 2** – Setting up two new Waste Water Treatment Plant for Fierbinti and Dridu localities.

Following an assessment from a technical point of view, and also financial was selected **Option 1 – „ Setting up a municipal Waste Water Treatment Plant (WWTP) Fierbinti, using the classic treatment technology”**, considering that fulfils tha criteria of an optimal and viable solution for the mentioned systems.

3.2. Sites alternatives

Taking into consideration the studied objective there are no alternatives for the location.

3.3. Designed alternatives

Not applicable. By this Project were imposed and will be respected the present legislation regarding the execution works and also the recommendations for how to operate the water supply and sewerage system, and also the Waste Water Treatment Plant.

Proposed constructive solutions, utilised materials to set up these constructions, volumes regime, regime to develop on horizontal and vertical of investment components, finishes and architectural concept are to ensure a good functionality, a durability and a reliability of equipments and constructions.

It is considered that the chosen solution will offer a high efficiency regarding price-efficiency report and in the same time fulfils the necessary technical conditions.

3.4. Alternatives regarding the execution method

Not applicable. Were proposed modern execution methods and are to be used best quality materials.

4. Monitoring

During execution the monitoring activity will respect the specific requirements of constructions and installations activities.

In the Project implementation period will be considered the following:

- bringing of affected surfaces to the initial state
- monitoring the degradation of the road system on the routes affected directly (trough execution of diggings, pavement removal) or indirectly (as a consequence of traffic deviation on these roads)
- will be exercise a sever control to concrete transportation with special vehicles, to prevent accidental discharges on the route or throwing cement milk inside the construction site, water courses or public roads
- at the end of the week the working fronts will be cleaned, all waste being eliminated.

When starting operation at the objective will be established a monitoring system – **detailed monitoring plan** with precise measures for the Beneficiary. Will be considered the following:

- monitoring water quality that will be distribute to the consumers
- proper maintenance of the sewerage system
- monitoring water quality at the entrance and exit of the Waste Water Treatment Plant and of effluents, with the established frequency by the competent authority for environmental protection and waters management.
- maintaining the Waste Water Treatment Plant efficiency according to the Project, in a manner to ensure the water treatment according to the present legislation
- proper maintenance of the sewerage system, to avoid disfunctionalities on the evacuation route and waste water treatment

- monitoring the sludge quality in accordance with Ord. 344/2004 or Ord. 95/2005, depending on sludge destination.

Impositions into the contracts (regarding taking or evacuating into the waste water sewerage network), signed with divers economical agents, of a condition to include the waste water in the conditions from GD 188/2002 – NTPA 002/2002, modified and completed trough GD 352/2005 regarding waste water evacuation.

Accomplishing monitoring measures will be set up in their own authorised laboratory, using standardized methods. The results of the self monitoring will be recorded and transmitted to the environmental authorities.

The reporting of the monitored quality indicators are accomplished monthly to Buzau-Ialomita Water Direction.

The priority substances will be monitored with a biannual frequency, and prior dangerous substances will be monitored with an annual frequency, depending on the obtained results, and from case to case the monitoring frequency can be modified

Monitoring the environment in the Execution Period, and also during the Operation Period of the Waste Water Treatment Plant aims to apply the proposed measures by the present Report to Environment Impact Assessment Study when generating a minimum environmental, over population and localities impact, in order to follow the sustainable development concept.

5. Risk situations

In the execution period, and also in the operation period of the Project **„Rehabilitation and modernization of water and wastewater supply system in Ialomita County– FIERBINTI-DRIDU agglomeration”** is the possibility to appear accidents with a significant environmental impact, generated by the following activities:

- Transportation and manipulation of toxic and dangerous substances as combustibles, chemical substances utilised in the treatment process
- Supplying of the equipment and construction machinery with combustibles
- Losses from fuels storages , where the tanks are not impermeable
- Accidents of construction materials that are transporting toxic or dangerous substances.

6. Accidents prevention measures

In order to prevent potential accidents resulted as a consequence of the developed activities for the analysed objective, it is necessary to adopt the following measures:

- monitoring the equipment functioning manner, the impermeability of oil and fuel, for transportation vehicles and equipment, storage recipients
- setting up fences, signalising and other warnings to limit working areas.
- to prevent risks of producing pollutions from accidents will be elaborated intervention programs that would foreseen the necessary measurements, teams, intervention endowments and equipments in case of accident.
- verifying the equipment and transportation vehicles before starting works if these are functioning in optimal parameters and if are not possible defections that could lead to possible combustible losses
- verifying at clocked periods, of electrical installations, of comprised air, oxygen tanks or other explosive, inflammable, toxic or dangerous materials if are functioning at optimal

parameters

- immediate action in case of accidents of authorities with ability and take measures to eliminate the pollutants and ecological rebuild of the affected area.
- implementing an emergency call system to ensure the possibility to transmit information characterised like emergencies, as accidents.

Necessary works to rehabilitate the temporary utilised surfaces and ecological rebuilding of peripheral areas affected by works

Because there are no areas or environmental factors affected were foreseen no ecological reconstruction works.

There are possible minor events in the works execution period in punctual areas, as accidental pollution with fuel from vehicles and equipments, exceed the noise level into the functioning equipment area.

There are foreseen rebuilding works and initial state improving by redoing the vegetal layer.

All works are to be executed under strict supervision of inspectors, and after finishing the construction works will be executed works to rebuild the area and give it beck to the natural circuit, thus:

- demolish the constructions and the structures specific to the construction site organisation
- collecting, reusing and transporting out of the site of the waste resulted from the execution activity
- rebuilding the site in the access, technological roads area and others temporary occupied surfaces by levelling the soil, becoming overgrown with grass and landscaping arrangements by consulting botanists, landscape and horticulture specialists
- rebuilding the vegetal layer immediately after finishing works
- decontaminating the areas that were accidentally polluted with hydrocarbons or other dangerous substances
- testing the soil to decide the level of pollution caused by the construction activity in order to apply measures to lead to give back a satisfactory state to the area

7. Conclusions and recommendations

The Report to the study of impact assessment takes out the causes and consequences of negative and positive effects over the environmental factors caused by implementing the Project „Rehabilitation and modernization of water and wastewater supply system in Ialomita County– Fierbinti - Targ agglomeration”.

When elaborating the present report were considered the following elements:

- Reports, analyses, environmental studies and documents offered by the Beneficiary and by the Designer
- Present legislation regarding the environment protection
- Imposed normative by the local environmental protection authority
- Local Environment Action Plan
- Annual Reports regarding environmental factors state for Constanta County - 2008
- Special literature data, guides, guidance , normative, encyclopaedias

The main aspects regarding the environmental factors pollution are about water, soil, air, human locations pollution and also of degrading the landscape.

Environmental impact assessment was elaborated by considering the numbered criteria from the following tables, being structured by the following fields:

- Alterations over the environment factors
- Effects of alterations of the environment factors upon the population

From the environmental impact assessment, detailed in this report, results an insignificant and unpersistent effect

By analysing the Project situation in the elaborating process of **ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT**, were underlined the measurements that should be respected by the **Constructor** and **the operator of the water supply and sewerage in Ialomita County– Fierbinti - Dridu agglomeration**, in the execution period and also in the operation period to be as the environment protection present legislation demands.

It is not the case for supplementary measurements, considered as efficient to minimise the impact.

The Project represents measure with important positive effects upon the environment.

At the end, can be drown a conclusion that negative effects appeared during accomplishing the objective, presented in this report, do not lead to environment factors alteration.

Taking into consideration the results of analysing the Project, it is recommended the approval from the environmental point of view of „Rehabilitation and modernization of water and wastewater supply system in Ialomita County– Fierbinti - Dridu agglomeration”.

ALTERATIONS OF THE ENVIRONMENTAL FACTORS	
CRITERIA	**EFFECTS ESTIMATION**
▪ **negative effects upon the health of the biotope**	▪ insignificant
▪ **warning to rare or in danger species**	▪ rare or in danger species were not defined in the area
▪ **reducing species diversity or perturbing the alimentation chain**	▪ insignificant
▪ **loosing or splitting habitats**	▪ insignificant
▪ **discharging or producing persistent chemical substances, microbiological agents, nutrients, radiations, thermal energy**	▪ not applicable. Discharged waste water into the emissary will be treated and will respect the maximal admitted limits by NTPA 001 and the Water Management Permit no. 1221/8.05.2008
▪ **exploiting environmental material resources**	▪ with insignificant effect
▪ **transforming the natural landscape**	▪ with insignificant effect The general impact of the accomplishment of the investment upon the landscape characteristic to the Waste water Treatment Plant area can be considered as a positive one.
▪ **obstruction of the migration or the passing ways**	▪ with insignificant effect
▪ **negative effects upon the quality or quantity of the biophysical environment (surface waters,**	▪ with insignificant effect Discharged waste water into the emissary will be treated and will respect the maximal

underground water, soil, air)	admitted limits

EFFECTS OF THE ALTERATIONS OF THE ENVIRONMENTAL FACTORS UPON THE POPULATION	
CRITERIA	**EFFECTS ESTIMATION**
▪ **negative effects upon the human health**	▪ these kind of effects are not marked; can be appreciated that the population comfort level will be increased by accomplishing the investment
▪ **increasing the number of unemployed or economical damage**	▪ positive effects; creating new jobs; offers an increase to the population comfort level
▪ **reducing the quality and the quantity of the recreational capacity**	▪ with insignificant effects; accomplishing the investment can influence positive the possibility for touristic development.
▪ **major alterations in the current utility of the land and of resources in traditional purposes by the local population**	▪ with insignificant effects; rehabilitating the Waste Water Treatment Plant has no necessity for new lands
▪ **negative effects upon the historical, archaeological, paleotological and architectural resources**	▪ insignificant effects, irrelevant for the location of the analysed objective
▪ **reducing the esthetical values or modifying the visual valences**	▪ positive effects; improving the urban scenery during rainy periods
▪ **affecting future utilisations of resources and coastline**	▪ will influence positively the natural resources of the coastline area
▪ **loosing or reducing rare or in danger species, and theirs habitats**	▪ insignificant

NON TECHNICAL SUMMARY

LOCALITES OF SIBIU, CISNĂDIE, RĂŞINARI, ŞELIMBĂR AND MOHU

The report to the environment impact assessment covered all the aspects mentioned in Annex 2 to Order 863/2002, and its conclusions are presented in the following pages.

1.1 PROJECT DESCRIPTION - WATER SUPPLY SYSTEM

1.1.1 Drinking Water Treatment Plant Sibiu-Sud

The existing drinking water treatment plant Sibiu-Sud, was designed to treat the water from the dam intake of Sadu River and it is not finalized. It will be re-built based on a modern technology that will take into account all the raw water quality parameters, and that will ensure to the consumer a drinking water within the normal limits of all parameters provided by Directive 98/83/EEC on drinking water for human consumption.

The DWTP Sibiu Sud will be designed for 400 l/s and ensures the following treatment process:

- pH adjustment (required for an efficient coagulation process);
- Pre-ozonation (required for the removal of the organic matters existing in the raw water);
- Coagulation (required for an efficient settlement);
- Flocculation (required for an efficient settlement);
- Settlement (required for the removal of micro-particles and the precipitating agents from the water);
- Rapid filters (required for the removal of fine particles);
- Post-ozonation (required in the case when there are pesticides in the water or for odour and taste control);
- Granular activated charcoal (GAC) (required in the case when pesticides are present in the water);
- Filters for Manganese removal (required if the Manganese level is high);
- Chlorination (required for disinfection);
- Sludge thickening and return backwash water recovery (required for the optimization of the investment costs);
- Sludge dewatering (required for decreasing the storage costs);

1.1.2 Drinking Water Pumping Stations, Transmission Mains, Storage Tanks

Inside the Sibiu Sud DWTP a pumping station will be mounted, it will have a capacity of 120 l/s pumping the treated water to the storage tanks of Cisnădie and Cisnădioara localities, via transmission mains, as follows:

- Transmission main, total length 2965 m, up to the entrance of Cisnădie town;
- Transmission main, total length 3895 m, towards the existing storage tank at Cisnădie;
- Transmission main, total length 4896m Cisnădie – Cisnadioara, feeding the new 150 m^3 storage tank provided for Cisnădioara.

Inside the new storage tank structure at Cisnădioara a pumping station will be mounted with a capacity of 15 l/s, pumping the treated water coming from the pumping station of the Sibiu Sud DWTP to the new 500 m^3 storage tank to be provided, for the Răşinari and Prislop localities, via a

transmission main in total length of 1596 m.

A new 350 m^3 storage tank will be also provided for the villages of Mohu and Vestem, fed directly from the Sibiu city water supply network.

All the drinking water storage tanks that will be provided according to this documentation have also a related chlorination plant that will ensure the allowed residual chlorine quantity as provided by the technical standard STAS 1342 (0.1 mg/l).

1.1.3 Drinking Water Distribution Networks

The pipes used for the distribution network rehabilitation and extension will be made of HDPE, located according to technical standard SR 8591/1997, providing the requirements for the location of the underground utilities networks. There will be provided also section valves in the main network nodes and fire hydrants, located at a maximum distance of 100 m one from the other.

1.1.3.1 Sibiu Municipality

There were proposed rehabilitation works for the networks made of steel and cast iron pipes in the Valea Aurie city district for a length of 3237 m and Vasile Aaron city district for a length of 4471 m, which are extremely worn out, and the rehabilitation of all networks made of asbestos cement pipes, for a length of 4755 m, because they are extremely damaged and also because Romania has the obligation to ensure the replacement of these pipes as asbestos cement is no longer allowed for water networks. Thus, the water losses will be reduced and, at the same time, the number of annual interventions due to breakdowns will be also reduced.

The extension of the distribution network was proposed for the Compa city district, for a length of 963 m and Viile Sibiului for a length of 2915 m.

1.1.3.2 Cisnădie Town

This documentation proposed rehabilitation works for a network length of 3903 m in areas where the networks are old and very damaged, in order to decrease the water losses and the number of annual interventions due to breakdowns, and to fully cover the town with water distribution networks.

In the important areas of the town, it is immediately needed to rehabilitate and extend the distribution networks, and these works are being executed based on local funding.

1.1.3.3 Răşinari Commune

At present, there is a drinking water distribution network, in a very bad condition because it is very old, undersized and it was built in a chaotic way.

This study proposed rehabilitation works for the networks, for a length of 12114 m and works for distribution network extension for a length of 8118 m.

1.1.3.4 Şelimbăr Commune

The water distribution network of Şelimbăr commune is in a good shape, is made of HDPE pipes, the networks were built between 2000-2007 and the commune has a satisfactory coverage rate. The only problems are generated by the connection pipe to the Sibiu city network, which ensures the necessary flow and pressure to some areas of the commune. This pipe is a zinc coated one (galvanized) was built in 1975 and not functioning at present due to the high water leakages. A 4000 m long pipe has been designed, with a different route than the route of the existing one, and it will be connected to a main distribution pipe/artery existing in Sibiu city, in Agnita area, via a manhole with inlet valve and water meter.

A connection to this pipe will be executed in the Bungard village area towards the distribution network of this village.

1.1.3.5 Mohu Village

By assessing the existing situation regarding the distribution network in Mohu village, it was decided that the current coverage is sufficient, the network needs to be completed by a connection pipe from the storage tank designed by this documentation, having a length of 300 m.

1.2 PROJECT DESCRIPTION - SEWERAGE SYSTEM

1.2.1 Sewerage Network and Wastewater Pumping Stations

1.2.1.1 Sibiu Municipality

By assessing the current situation of the Sibiu city sewerage network, it was concluded that it is necessary to extend the domestic wastewater network in few areas of the city, and also to rehabilitate some sewers in order to improve the sewerage network.

It is proposed to extend the Sibiu city domestic wastewater as follows:

1160 m in Sacel – Prelungirea Sacel area, a residential area in full development. The wastewater will be evacuated by pumps, because of the topography of the area, for a capacity of 10 l/s, with a pressure pipe having a length of 211 m;

620 m in Veterani city district, this is a residential area in full development;

2908 m in Viile Sibiului city district, currently without sewerage network. The domestic wastewater collected by the new sewerage network will be evacuated in the existing GRP collector located on the side of national road DN14, a national road under crossing is needed, and this under crossing will be executed according to the technical standard STAS 9312-87 – “Roads and railway pipe under crossings”.

The wastewater collection in Sibiu municipality is mainly a unitary system. The existing unitary sewers are made of concrete and they have exceeded their length of service. Because these sewers are extremely damaged, a part of the wastewater is infiltrating underground, thus infesting the water table and the soil, and the ground water drained in the sewers leads to the exceeding of the sewer transport capacity, as well as leads to a high dilution rate of the wastewater, thus the operation of the wastewater is disturbed. The unitary sewers proposed for rehabilitation will be will have a length of 14735 m, will be made of PVC SN4 for diameters smaller than 500 mm (inclusively) and made of GRP for diameters larger than 500 mm.

1.2.1.2 Cisnădie Town

The existing sewerage network of Cisnădie town is a separative one, contains old concrete pipes with an age higher than 20 years, and PVC and polyethylene pipes. The PVC and polyethylene collecting pipes were built during the last 10 years and are in a good condition. It is necessary to perform significant works for the rehabilitation of the concrete sewers as well as extension works of the sewerage network, works that will be partially financed by local funds in the important area of the town that need urgent works, and partially by the Cohesion Fund.

The works regarding the sewerage network included in this documentation are as follows: network rehabilitation for a length of 5719 m and network extension for a length of 3140 m.

This documentation proposes also replacement works for replacing a gravitational section of the ovoid shape sewer 500 x 750 mm, which transfers the collected wastewater from Cisnădie to the

wastewater treatment plant of Sibiu municipality, located in the village of Mohu. At present, this sewer does not transport any wastewater to the WWTP Sibiu, it needs rehabilitation. At the crossroad with DN1 (national road) it is designed to build a wastewater pumping station with a capacity of 108 l/s on this network section, this will pump the wastewater flow of Cisnădie town, as well as the flow from the buildings located along DN1 belonging to Şelimbăr commune, to the main sewer entering the WWTP. The pressure pipe having a length of 2800 m, will have on its route railway under crossings, national road under crossing and rivulets (Cisnădie and Seviş) under crossings executed according to technical standards, with horizontal drillings, in protection duct, by a specialized company.

1.2.1.3 Răşinari Commune

Because the commune of Rasinari has currently no sewerage network, this documentation provides sewerage networks execution works for a length of 17459 m made of PVC pipes.

Because the configuration of the sewerage network, it was necessary to design also two wastewater pumping stations, one with a capacity of 5 l/s, and one with a capacity of 9 l/s.

The sewerage network will evacuate the wastewater to a PVC transfer sewer to the Sibu municipality sewerage network, having a length of 8750 m.

1.2.1.4 Şelimbăr Commune

Şelimbăr commune has a domestic wastewater sewerage network. The sewerage network is made of modern materials, was built during 2001-2007 and is in a good condition.

Five wastewater pumping stations are needed according to the configuration of the sewerage networks. At present, one WWPS is in operation, one is being built, two of them were included in applications for other funding programmes and their approval is in progress. This study provides the fifth WWPS that will pump wastewater from the big consumers along national road DN1 to an existing sewer on the other side of national road DN1.

This WWPS will ensure a capacity of 18 l/s via a HDPE pressure pipe, with a length of 35 m that will under cross the national road DN1. This under crossing will be executed according to technical standards, with horizontal drillings, in protection duct, by a specialized company.

All sewers provided by this study will be made of high length of service and extremely tight materials, the sewerage network will have also manholes built in the direction change points, slope changing points, in intersection points with other collectors and at a maximum distance of 50 m one from the other.

1.2.2 Regional Wastewater Tretament Plant Sibiu – located in the village of Mohu

The rehabilitated wastewater treatment plant was commissioned in July 2007; it ensures mechanical and biological wastewater treatment.

In order to reach the compliance with Directive 91/271/CEE provisions regarding the maximum allowed concentration of 10 mg/l total N and 1 mg/l total P in the treated effluent, the advanced treatment stage is required.

Based on the checks made regarding the calculations for dimensioning the plant, and according to the number of population equivalent forecasted to be connected to the water supply/wastewater systems, 180.000 p.e., the following solutions have been adopted:

- Chemical removal of the Phosphorus and biological removal of Nitrogen inside the existing activated sludge tanks, for 80.000 p.e.;

- Biological removal of Phosphorus and biological removal of Nitrogen inside the new activated sludge tanks, designed for 80.000 p.e..

The table below presents the average daily flows and the localities that will be served by the modernized wastewater treatment plant:

Table 1: Populatia served by the wastewater treatment plant and the related average daily flow

Locality	Estimated population equivalent (p.e.)	Average daily flow (m^3/day)
Sibiu	153 791	76 420
Selimbăr	5 484	2 725
Mohu	756	375
Cisnădie	15 684	7 793
Răşinari	5 407	2 687
Total	**181 122**	90 000

The effluent is discharged into the emissary which is the Cibin River. The distance of the WWTP site to the nearest residential houses is of about 1000 m.

Regarding the existing wastewater treatment plant, works for mounting a pumping station will be also executed. This pumping station has the role to equally split the flow to the two activated sludge tanks (one existing, one to be provided), in order to circulate the wastewater, the return activated sludge and the necessary air inside the aeration zone for the new activated sludge tank to be provided.

The chemical removal of Phosphorus will be achieved by introducing in the distribution chamber of the final settlement tanks a coagulant agent (Aluminum Sulphate also used at the drinking water treatment plant) that will enhance the precipitation of the Phosphorus compounds that will then settle inside the final settlement tanks and will be eliminated in the surplus activated sludge. Thus, the sludge volumes produced by the WWTP will increase and an additional sludge dewatering equipment will be needed.

The extension works regarding the existing Sibiu (Mohu) WWTP include the following technological objects:

- Screened wastewater pumping station
- Distribution chamber for the new activated sludge tank;
- Activated sludge tank;
- Extension of the existing blower station
- Refurbishment of the surplus and return activated sludge pumping station
- Aluminum Sulphate and lime dosing and storage
- New building for the surplus sludge mechanical thickening and dewatering, including polymer making up and dosing devices;

The location of the works included in this study is on plots of land belonging to the public domain of Sibiu, Cisnădie, Răşinari, Şelimbar and Mohu localities.

1.2.3 Physical and Biological Pollutants

The noise sources are: pumps, blowers, the sludge thickening and dewatering equipment and the transport vehicles, but following noise measurements it was noticed that no exceeding of the allowed limit of 65 dB provided by technical standards STAS 6156/1986 and STAS 10009/1988 and of 90 dB, provided by Article 44 of Order 1957/1995 regarding the approval of labour health conditions norms has been recorded.

The biological pollutants in the wastewater may be generated by medical and veterinary units, but they have to disinfect the wastewater prior to its discharge in the sewerage network, so that only non significant quantities of these kinds of pollutants reach the wastewater treatment plant, but during the advanced treatment these small quantities of bacteriological pollutants are reduced by adding disinfection agents.

1.3 TEHNOLOGICAL PROCESSES

1.3.1 Finalization of the Drinking Water Treatment Plant Sibiu Sud

This plant will be a modern one, with efficient technologies, it will remove the organic matters from the raw water by pre-ozonation process, the coarse suspended solids by coagulation and settling processes, the fine suspended solids by rapid filtering and an efficient disinfection by chlorination. In order to remove the pesticides, the water is filtered through granular activated charcoal and also a post-ozonation process is performed, and for Managnese removal, Managanese removal filters will be used, so that the drinking water fed into supply will be compliant with Directive 98/83/EEC provisions.

1.3.2 Extension of the Wastewater Treatment Plant Sibiu

The extension of the wastewater treatment plant Sibiu in order to be compliant with Directive 91/271/CEE provisions regarding the quality of the effluent discharged in the natural emissary, will be done by using efficient technologies for the advanced wastewater treatment, meaning the biological removal of Nitrogen by nitrification and denitrification in aerobic and respectively anoxic zones of the activated sludge tank, and biological Phosphorus removal inside the anaerobic zone of the activated sludge tank and the chemical Phosphorus removal by introducing a coagulant agent in the distribution chamber of the final settlement tanks.

1.4 WASTE MATERIALS

During the project execution stage lots of solid waste and debris will be generated - from the replacement of the water supply/sewerage networks and from the works at the wastewater treatment plant and drinking water treatment plant. These waste materials will be selectively collected and managed by specialized companies.

During the wastewater treatment plant operation stage, the solid waste and the sludge will be handled as they are currently handled. It was estimated that, at the WWTP, the sludge volume will increase by 10% due to the Phosphorus chemical precipitation process. The sludge from the DWTP will be treated at the DWTP in order to be dewatered and afterwards transported to the wastewater treatment plant Sibiu-Mohu. At the WWTP it will be further treated together with the sewage sludge in order to be stored at the ecological landfill of the WWTP and used for agricultural purposes.

As regarding the sludge, a general strategy at county level has been developed, a viable constructive, economic and environmental solution has been identified, the regional operator has expressed the option to use the sludge for agricultural purposes and to store the sludge at the ecological landfill.

1.5 FORECASTED IMPACT ON THE ENVIRONMENT

1.5.1 Water

The works regarding the rehabilitation of the drinking water transmission mains, rehabilitation of the existing water distribution networks, pumping stations, storage tanks, sewerage systems, wastewater and drinking water treatment plants have in general a positive impact on the surface and ground water.

The achievement of a modern drinking water treatment plant has a positive impact on population health by supplying high quality water.

The extension of the water supply networks will have a positive impact especially on population health, by ensuring the supply of appropriately treated water, and its quality parameters will be strictly monitored.

The rehabilitation of the existing water supply networks will decrease the number of breakdowns because of the old age and inappropriate materials the pipes are made of, and implicitly reduce the water leakage and the infiltrations of water containing contamination agents in the distribution networks.

The rehabilitation of the sewerage networks will also have a positive impact. Compared to the current situation when, because of the old age and inappropriate materials the sewers are made of there are recorded many breakdowns which generate groundwater, soil and subsoil pollution, after the project will be finalized, the situation will be significantly improved.

The modernization of the wastewater treatment plant will have a positive impact on the surface and ground waters, by removing the total N and total P from the treated discharged effluent, this being a mandatory requirement to be fulfilled by year 2013, thus ensuring the protection of the surface water and of the aquatic eco-systems.

The water supply network do not represent likely pollution sources of the water, neither during execution stage, nor during the operation stage, they will distribute treated drinking water to various consumers.

Under normal operation conditions, the sewerage networks, pumping stations, storage tanks are no pollution sources. The pollution occurs only when there are ex filtrations because of the damaged sewers or a breakdown regarding the functioning of the objects at the WWTP. All these can be avoided by a correct operation, periodical inspection of the objectives and rapid intervention for damage repair and environmental negative impact mitigation in case of breakdowns.

During investment execution stage the water pollution sources are:

- Accidental leakages of materials, fuels, lube oils from various machinery and vehicles;
- While excavation works, building materials or earth particles may reach the waters.

In order to prevent the pollution, measures have been proposed, measures that will be enforced to the contractors. Due to the fact that, at present, there are efficient machinery, equipment and building materials, we appreciate that the period of works execution will be reduced, and the impact on waters during this time interval will be minimum.

During operation, the water supply and the sewerage networks will have a positive impact on waters. The networks will be made of resistant materials pipes with a long service lifetime. The modernized wastewater treatment plant will be constructively and technologically appropriate. The project provides plant operation measures, as well as sewage sludge treatment measures.

By the proposed technology and correct operation, the effluent quality parameters will be compliant with the allowed limits provided by the legislation in force, namely NTPA 011/2002, included in Governmental Decision 188/2002, modified and completed by Governmental Decisions 352/2005 and 210/2007.

The Sibiu wastewater treatment plant is permanently monitored as regarding the flows, as well the effluent quality parameters, by a modern equipped laboratory and specialized personnel, certified by RENAR. In order to reduce the risk of accidental pollution there are prevention and action plans providing effective measures to prevent water contamination.

The treatment process proposed will lead to the decrease of pollutants in the raw water so that the pollutant concentration in the effluent will be ranging within the allowed limits provided by the NTPA 011/2005 normative.

Under these circumstances, the impact on the emissary may be considered as a reduced one.

During investment execution stage the water pollution sources are:

- Accidental leakages of materials, fuels, lube oils form various machinery and vehicles;
- While excavation works, building materials or earth particles may reach the waters.

In order to prevent the pollution, measures have been proposed, measures that will be enforced to the contractors. Due to the fact that, at present, there are efficient machinery, equipment and building materials, we appreciate that the period of works execution will be reduced, and the impact on waters during this time interval will be minimum.

During operation, the water supply and the sewerage networks will have a positive impact on waters. The networks will be made of resistant materials pipes with a long service lifetime. The modernized wastewater treatment plant will be constructively and technologically appropriate. The project provides plant operation measures, as well as sewage sludge treatment measures.

1.5.2 Air

During the investment execution stage, the potential pollution sources are: dust produced during excavation works, gas emissions from vehicles and different machinery. The impact on the air will be a local one and for a short period of time, in this respect the project proposed effective measures for their mitigation.

During operation, the water supply network may not be considered an air pollution factor. The wastewater networks may generate malodour, in order to limit this, maintenance works are being proposed and also natural ventilation via manholes. As regarding the wastewater treatment plant, it is mandatory to strictly control de treatment process for the designed objects, in order to limit the occurrence of the anaerobic uncontrolled process, which may produce malodour, especially regarding the sludge line.

Under normal functioning conditions, the wastewater treatment plant operation and the water supply/sewerage networks operation will not generate significant air pollution.

Thus, by implementing the proposed measures and by an appropriate plant operation, there will be a minimum impact on the air.

1.5.3 Soil and Subsoil

To achieve the proposed investments, excavation works are needed and afterwards works for land reinstatement at its initial shape.

When designing the sewerage system, two important elements have been taken into account: to ensure a perfect tightness and to clearly separate the water supply network. The following have

been taken into account, as well: sufficient slope, appropriate depth and diameters to ensure the wastewater collection, to avoid thus any clogging and street flooding from sewers.

For the wastewater treatment plant, soil protection measures have been proposed by using materials able to ensure tightness, by building the temporary storage platforms for the activated sludge, according to the legislation in force.

For an efficient soil protection, the following measures must be taken, during the building stage, as well as during the operation stage:

- avoiding storing on the ground of different chemicals used in the water chlorination plant or the wastewater treatment plant.
- Avoiding storing on the ground of the materials resulted from the cleaning of the sewers.
- Immediate evacuation of waste of any nature, resulted from the water supply/sewerage network repair/maintenance activities.

As a general measure, too, the uncontrolled storage of waste of any kind resulting from the different proposed technological activities must be avoided.

The contracting provisions must include also specific measures regarding the management of waste produced on investment sites, in order to avoid soil pollution. Some of them are presented below:

- any used material will be stored in closed places;
- the site must be maintained clean and tidy;
- the use of any hazardous substances during building stage will be allowed only after obtaining the necessary approvals, according to their chemical/physical features, this includes also their storage required measures.

The impact of site organization works on soil and subsoil will not produce any modification in the soil and subsoil structure.

During operation, the potential pollution sources could be generated by the not enough waterproofed tanks or transport wastewater pipes inside the wastewater treatment plant. These should be built of concrete and water proofed so that no pollution risk for the soil would occur.

By implementing the established constructive measures and by observing the operation instructions, we consider that the impact on the soil and subsoil well be minimum.

1.5.4 Biodiversity

The pollution sources with a potential impact on ecosystems during execution stage may be generated by: site organization, accidental domestic wastewater leakages, domestic solid waste and construction solid waste. In order to protect the eco systems, measures will be taken during the entire site organization works period.

During the operation stage, the project impact on the main environmental factors, such as water, air, soil and subsoil is assessed to be minor, even non significant, on each of the above mentioned factors.

The proposed project will not produce any changes related to the woody areas, water bodies, protected areas or habitats of some protected plant species. The proposed project will not produce a negative impact on the local flora, on the populations of the bird, mammal, fish or invertebrate species.

The investment works proposed for the Sibiu, Răşinari, Cisnădie, Şelimbăr and Mohu localities are located at a distance of 0.5 km from the Oltul Mijlociu-Cibin-Hartibaciu Site of Community Interest – SCI, (near Mohu locality). Compared to the other localities, the site is at bigger distances; for

example 2.0 km from Cisnădie town, 4.0 km from Şelimbăr commune.

Taking into account the big distance between the Natura 2000 sites and the proposed investments, no species or target habitats of these sites would be affected by the works.

No additional protection measures are necessary to mitigate the impact on the flora and the fauna for the designed objectives, other than the ones specific for the environment protection factors measures previously described.

1.5.5 Landscape

After the execution or replacement of the water supply/sewerage networks, the temporarily occupied plots of land will be reinstated to return to their initial shape.

For the extension of the wastewater treatment plant Sibiu-Mohu the works will be executed in the area of the existing plant, so that the landscape will not be modified.

1.5.6 Social and economic environment

The project will have a positive impact on the local population by providing quality services regarding water supply/wastewater collection and an appropriate treatment of the wastewater.

The social aspect of this project, is represented by the fact that the population of the area will be positively influenced by the execution of this project by benefiting from a water of appropriate quality, so that the drinking water for the population to be healthy, clean and compliant to the parameters set for the drinking water for human consumption by Law 458/2002, modified and completed by Law 311/2004.

Another positive aspect of the execution of the project is represented by the extension/execution of the water/wastewater networks that will facilitate the connection of the population to water supply/wastewater collection services, thus the level of comfort and civilization would significantly increase.

The social aspect of this project, is represented by the fact that the population of the area will be positively influenced by the execution of this project by benefiting from a water of appropriate quality, so that the drinking water for the population to be healthy, clean and compliant to the parameters set by the legislation in force.

Moreover, the water treatment by using efficient technological processes and the monitoring, both proposed by this project, have a positive impact on the drinking water quality supplied for the population compliant to Directive 98/83/EEC provisions. If the two above mentioned elements will not be provided (efficient treatment process and monitoring) according to the monitoring and sanitary inspection standards, the quality of the supplied water will not be appropriate and compliant.

We would like to mention also the positive impact of the execution of the water supply system on the economic environment, by taking into account the fact that utilities are of utmost importance in the area, especially water supply, for attracting investors in the area.

As a result of the building/extension of the wastewater network, the wastewater discharge and accidental leakage will be eliminated by connecting a higher population rate to the water collection/treatment services. The soil and the water table pollution because accidental leakage will be decreased to minimum, as well.

The execution of the sewerage network and the possibility to be connected to this network will have an economic positive impact, as well: the investors will be attracted to the area, because the utilities are close to their proposed business activities locations.

Another important social aspect regarding the progress of this project is the fact that it will create

new jobs for the population in the area, during execution stage, and also during its monitoring.

Another facility of the designed sewerage system is the wastewater treatment plant Sibiu-Mohu which, by adding the advanced treatment stage will ensure an effluent to be discharged in the emissary compliant to Directive 91/271/CEE provisions. The wastewater treatment plant is located about 1000 m away from the residential houses.

1.5.7 Measures for Mitigating the Impact on Environmental Factors

1.5.7.1 Water

Taking into account the fact that no significant impact on waters has been forecasted during the execution stage, no special measures for water protection are required.

For the site organization activities, the environmental protection normatives will be observed. In order to prevent the accidental leakage of oil products that can be circulated by rainfalls, the machinery maintenance, the oil replacement and refueling will be made only in special set areas for these activities, and only by specialized personnel. Moreover, the repairs and technical inspections of machinery and installations will be performed periodically, according to schedules and technical specifications, in specialized workshops.

In order to avoid the accidental contaminations and mitigation of the impact on the environmental factor “water”, during the building stage, the following measures will be taken:

- Optimization of the route of vehicles and machinery transporting the excavated material or building materials;
- Fencing the investment objects starting from the very early building stages;
- Monitoring of the quality of environmental factors all along the duration of the works execution;
- Periodically checking and maintaining all the machinery in a good appropriate technical condition;
- Observing the specific health and safety provisions, as well as the environment protection provisions related to the executed works.

On the other hand, during operation, the designed works regarding the water supply/wastewater networks, wastewater treatment plant, wastewater pumping stations have tried to ensure the protection of all ground water, by avoiding ex filtrations from the pipes.

These works are mainly the following:

- Perfect tightness of pipes;
- A sufficient slope, appropriate depth and diameters have been provided to ensure the wastewater collection, to avoid any clogging and wastewater flooding on the streets;
- Waterproofing of the inspection manholes and wastewater pumping stations;
- Clear separation between the water supply/sewerage network;
- Appropriate functioning of the wastewater treatment plant with inclusion of advanced treatment

Moreover, the water from the water table cannot reach the drilled wells because, when executing the wells, the aquifer phreatic table was isolated by cementing. The same constructive solution will be adopted also for the future monitoring drillings.

1.5.7.2 Air

The activities that will be performed during the designed works execution stage will not generate a significant impact on environmental factor “air”, the pollution produced may be considered as non

significant.

As regarding the air protection, during the building stage the provisions of the legislation in force will be observed. The materials will be transported in such a manner not to produce any dust by raising particles in the air, according to each case; the access roads would be watered, according to weather conditions during the execution of works.

We present below a few measures for mitigating the impact on the air:

- Using vehicles and machinery with low pollution engines;
- Reducing of the idle running time of the machinery engines and vehicles engines;
- Rapid detection of the potential non-tightness or damages and immediate intervention to eliminate their causes;
- Regular watering of the roads where the machinery is circulating, in order to mitigate or fully eliminate the dust pollution.

As regarding the polluting gas emissions (CO, CO2, SO2, NOx , dust with or without lead and volatile organic compounds) resulting from the fuel burning inside internal combustion engines of machinery and vehicles used, the following measures will be taken:

- Appropriate and efficient equipment, machinery and vehicles will be used;
- The used machinery and vehicles should observe all the requirements and standards regarding the exhausted gas;
- Periodically checking and maintaining all the machinery, equipment and vehicles in a good appropriate technical condition;
- Reducing as much as possible the number of stop-start of the used vehicles.

The designed objectives regarding the water supply network are no pollution source for the air, during their operation.

The technical solutions adopted by the designer for the water supply system are fully compliant with the legislation requirements regarding the polluting emissions level, as well as the ones regarding the total control of the factors that might have an impact on these.

During operation, measures will be taken for reducing the pollution due to emissions in the air by using efficient and appropriate equipment at the wastewater treatment plant.

1.5.7.3 Soil and subsoil

After the finalization of works, the area affected by the works will be reinstated at its initial shape by sowing grass or concreting, after case.

During the building stage, all the necessary protection measures will be taken according to technical standards for security in order to avoid the incidental events which could pollute the soil.

Thus, the following measures for prevention or mitigating the impact must be observed:

- Optimization of the route of vehicles and machinery transporting the excavated material or building materials taken from borrow pits
- Periodically checking and maintaining all the machinery in a good appropriate technical condition
- Measures for avoiding building materials from falling out of the transport vehicle
- Fencing the investment objects starting from the very early building stages
- Sowing with grass seeds and helping the natural regeneration of the non built areas starting even from the building stage
- Shortening of the execution period in order to reduce, thus, the duration of occurrence of

the negative effects
- Using of constructive modules that can be easily mounted and dismantled for buildings, roads and other facilities
- Separate storage of the uncovered fertile soil layer
- Monitoring of the waste resulted from the building activities
- Rapid intervention in case of accidental breakdowns to eliminate the causes and reduce the damages
- Collection of all accidental leakage and the ecological reconstruction of the areas likely to be polluted
- Monitoring system of the environment factors quality during building stage

During the wastewater treatment operation, the main measures to prevent the pollution impact on the soil are:

- the elimination of the influence on the neighboring area is ensured by a protection fence and also by planting a vegetal protection belt of the wastewater treatment plant, if this is not provided or if this protection belt is not thick enough;
- access road maintenance
- avoiding storing on the ground of different chemicals used at the water chlorination plant;
- immediate evacuation of waste of any kind, resulted from the water supply network repair/maintenance activities.

As a general measure, too, the uncontrolled storage of waste of any kind resulting from the different proposed technological activities must be avoided.

The contracting provisions must include also specific measures regarding the management of waste produced on investment sites, in order to avoid soil pollution. Some of them are presented below:

- any used material will be stored in closed places;
- the site must be maintained clean and tidy;
- the use of any hazardous substances during building stage will be allowed only after obtaining the necessary approvals, according to their chemical/physical features, this includes also their storage needed measures.

1.5.7.4 Biodiversity

The measures to protect the flora and the fauna during the building stage are to be taken starting from the design and organization stages of the works, in the following way:

- The location of the site organization, production bases and the access road routes are in a such a manner decided in order to generate minimum negative effects on the environment;
- The land plot temporarily occupied during the building must be limited to an area which is strictly needed;
- The non controlled storage of the waste resulted from building activities will be avoided, strictly observing the storage in the places decided by the environmental protection authorities.

The proposed project will not produce a negative impact on the mammal, fish and invertebrate species living in the emissary.

The waste materials, depending on their nature, will be transported in optimal timing at the specific compliant storage places.

The site barracks will appropriately located in areas where no natural eco systems will be affected. The machinery used for the works execution will be compliant to the standards provided by the legislation in force.

The terrestrial ecosystem (fauna, flora, etc.) and the aquatic one will not be affected by the nature of the proposed works, the terrain conditions and design principles.

In order to reduce the impact produced by the assessed site during operation, the beneficiary will take the appropriate measures described in detail in the previous chapters:

- fencing of the area by a protection fence - the elimination of the influence on the neighboring area is also ensured by planting a vegetal protection belt of the wastewater treatment plant, if this is not provided or if this protection belt is not thick enough;
- access road maintenance
- avoiding storing on the ground of different chemicals used for in the water chlorination plant;
- immediate evacuation of waste of any nature, resulted from the water supply network repair/maintenance activities.

1.6 ALTERNATIVES ANALYSIS

When deciding on the solution for achieving the routes, choosing the materials and technological process for executing the water supply/sewerage networks, more variants have been considered, and the chosen variant was the most advantageous one from the technical-economical point of view. Thus, for the water supply networks and pumping stations pressure pipes, HDPE pipes were chosen and for sewerage networks, PVC and GRP pipes were chosen, all these materials are new and resistant and have a long service lifetime. Modern technologies have been adopted for the replacement of the existing networks, the routes have been chosen in such a manner to reduce the pumping of water as much as possible, to reduce also the under/over crossings, activities that increase the investment costs very much.

In order to ensure the drinking water supply for the Cisnădie, Cisnădioara, Răşinari and Prislop localities, the option was to finalize the drinking water treatment plant Sibiu Sud. Following the assessment, the alternative of building a drinking water treatment plant on a new location at Cisnădie was not a feasible one.

Regarding the treatment of the wastewater collected from this area, the alternative regarding the extension of the Sibiu-Mohu WWTP by the advanced treatment stage, to ensure the removal of total N and total P was chosen and not the alternative regarding the building of local WWTPs on new sites, at Cisnădie and Răşinari.

Technologically, the solution adopted was the one proposed by the Pell Frischmann - Romair Consulting Consortium by using a well known technology in the world for the advanced treatment stage, for total N and total P removal

The chosen options were proven to be convenient technically, economically, and as regarding the risks related to their approval, building and facilities operation.

1.7 MONITORING

The monitoring of the environmental factors will be achieved during the building stage of the investments objects, as well as during their operation stage.

The environment protection and the monitoring of the project during the building stage will be ensured by observing the following requirements:

- the works will be executed in stages, according to the design, so that the generated impact to be less significant;

- the establishment of plots of land for site organization and for the waste generated by building activities storage places will be made by contractors when elaborating their tenders, according to legislation in force, by observing the minimum allowed regulated distances;
- regular checking of the legislation, standards and requirements enforced by the legislation on the execution of the designed works;
- using of an appropriate and efficient equipment, machinery and vehicles, to produce minimum exhaustion gases and emissions;
- checking of the locations regarding the accidental wastewater leakages.

In order to supervise the quality of the environmental factors and monitor the activity during operation stage, the following minimum measures are proposed for daily, monthly monitoring the performance of its activity regarding the environment protection, respectively the compliance with the standards enforced by the legislation in force, but not limited to taking the following additional measures:

- periodically monitoring of the drinking water quality at user level;
- periodically monitoring of the subsidence of filling materials on the route of the executed drinking water networks;
- monitoring of the appropriate functioning of the wastewater treatment plant.

We must emphasize that the control monitoring of the drinking water is very important, as it has as an important goal the periodical check of the organoleptic and microbiological quality of the drinking water, as well as the efficiency of the treatment technologies.

The monitoring of the drinking water quality will be performed by the producer, distributor and by the County Public Health Authority.

During the operation period of the water supply/wastewater collection treatment systems their functioning will be monitored quantitatively and qualitatively, the breakdowns will be detected in real time in order to repair the damages in the shortest time possible in order to reduce the water losses, for environmental protection and for the benefit of the population.

The drinking water treatment plant and the wastewater water treatment plant are provided with own analyses laboratory for the quality of the water entering and exiting the plant. The equipment is automated and allows the monitoring of the correctness of the treatment process. The treatment parameter monitoring system of the plant would be able to be connected in the future at the regional operator's SCADA system.

1.8 RISKS

Natural risks (flooding, earthquakes) occur independently the beneficiary's will and may lead to accidental pollution.

The risks related to the activities performed are the labour accidents, in order to prevent them the personnel should be trained, provided with protecting equipment and first aid spots.

1.9 CONCLUSIONS

In conclusion, we consider that the project with the following title:

„Extension and rehabilitation of the water/wastewater infrastructure in the Sibiu and Brasov Counties"- localities of Sibiu, Cisnădie, Răşinari, Şelimbar and Mohu, which was assessed by this Environmental Impact Assessment Report is fulfilling the proposed objectives ensuring the environment factors protection, improving the water supply/wastewater collection-treatment services, and by ensuring an efficient water source management.

NON TECHNICAL SUMMARY

AVRIG and MÂRŞA LOCALITIES

The report to the environment impact assessment covered all the aspects mentioned in Annex 2 to Order 863/2002, and its conclusions are presented in the following pages.

DESCRIPTION OF THE PROJECT AND ITS STAGES

Project Description

The investment objectives included in the project „Extension and modernization of the water/wastewater infrastructure in Sibiu County–Avrig and Mârşa localities" are to be achieved in Avrig town and respectively in Mârşa locality.

Avrig town is located at the feet of the Fagaras Mountains, on the Olt River valley, at an altitude of about 400 m. The town is crossed by National Road no 1, and is located at about 26 km distance from the city Sibiu.

The investments proposed by the project regarding Avrig town are the following:

Water supply related works:

- Replacement of the electrical mechanical equipment of the Avrig drinking water treatment plant and providing of laboratory equipment;
- Rehabilitation of the drinking water distribution network with on a length of 10,127m;

Wastewater collection/treatment related works:

- Replacement of the existing sewers on a length of 2.401 m;
- Extension of the existing sewerage network on a length of 6441 m;
- Inspection manholes on the sewerage network;
- Domestic wastewater pumping station;
- The WWPS pressure pipe with a length of 1245 m;
- New wastewater treatment plant on the Mare River bank, outside the built up area of the Avrig town.

Mârşa locality is situated South of Avrig town, at a distance of about 2.5 km from Avrig town.

The investments proposed by the project regarding Mârşa locality are the following:

Water supply related works;

- Rehabilitation of the drinking water distribution network on a length 4377m;

Wastewater collection/treatment related works:

- Domestic wastewater network Mârşa, on a length of 3 013 m.

- Inspection manholes on the sewerage network;
- Domestic wastewater pumping station;
- Pressure pipe with a length of 3.000 m in the sewerage network of Avrig town.

Occupied Land Surfaces

Land Surface that will be temporarily occupied:

- By the drinking water distribution network: 43.362 m^2
- By domestic wastewater network: 52.710 m^2
- Site arrangements/buildings: 6000 m

Land Surface that will be permanently occupied:

- Wastewater treatment plant: 5 365 m
- Pumping stations: 800 m^2
- Manholes: 178 m^2.

Utilities Providing

Power Supply

The necessary power supply will be ensured by the existing power distribution network in the area. For lighting, fluorescent tubes and incandescent lamps will be used.

Water Supply

The water supply of the wastewater treatment plant will be ensured by the existing water distribution network of Avrig town.

Design Parameters for Dimensioning

According to this project, the investments regarding the raw water catchment and treatment are limited to the replacement of the mechanical-electrical equipment from the catchment installation which are obsolete and worn out, and to the providing of an appropriate laboratory for the plant in order to manage efficient analyses of the parameters provided by the legislation in force regarding the water quality for human consumption.

According to the calculations, a flow of $\mathbf{Q_{u\_h\_max}}$ **= 99.66 l/s** drinking water will be distributed in Avrig, and a flow of de $\mathbf{Q_{u\ h\ max}}$ **= 39.36 l/s** drinking water will be distributed for Mârşa, flows for which the distribution network has been dimensioned and verified.

By assessing the current situation regarding the condition of the sewerage network and their coverage rate in the Avrig town, it was concluded that there are needed works for the rehabilitation and extension of the sewerage network that will evacuate the wastewater into a new wastewater treatment plant built on a new location.

The severely damaged sewerage network of Mârşa locality has to be totally rehabilitated, the designed network is considered as a new one, it is impossible to keep even one existing sewer in operation.

The wastewater flows taken into account when dimensioning the wastewater treatment plant Avrig for 12 000 p.e, and calculated according to the national and European standards are the following:

$\mathbf{Q_{u\ day\ average}}$**= 2640 m^3/day**

$Q_{u\ day\ max}$ = 3432 m^3/day = 143 m^3/h

$Q_{u\ hourly\ max}$ = 220 m^3/h = 5280 m^3/day

The treated effluent is discharged in the Raul Mare River.

TECHNOLOGICAL PROCESSES

The treatment process provided by the WWTP will be complex, of physical, chemical and biological nature, so that the treated effluent would be of appropriate quality to be discharged in the natural emissary, Raul Mare River.

The physical process means the mechanical separation of large solid matters by using screens, the gravimetric grit removal and removal of the grease collected at the surface of the wastewater, all these matters will be collected in containers and managed as waste.

The chemical process refers to the introduction of some chemicals to provoke the coagulation and flocculation of some compound substances in the wastewater, the newly formed substances will thus settle more easily in order to be separated and eliminated as surplus activated sludge.

The biological treatment will take place inside activated sludge basins that will comprise three distinct zones: anaerobic, anoxic and aerobic. Depending on the conditions created, in each zone specific bacteria to each process are developing. In the anaerobic zone, there are developing bacteria that are able to incorporate in their cellular body the Phosphorus from the wastewater, as Phosphates, and it is required to maintain the wastewater-activated sludge mix in balance.

In the anoxic zone there are developing denitrifying bacteria having the role to metabolize nitrogenous compounds (nitrites, nitrates) which are thus reduced to molecular Nitrogen which is released from the wastewater. In the aeration/nitrification zone the carbon compounds removal process takes place, as well as the change of ammonia into nitrites/nitrates. For the above mentioned purposes, the anaerobic and the anoxic zones will be fitted with submersible mixers, and pumps will be mounted in the aerobic zone to ensure the internal re-circulation of the activated sludge-wastewater mix (for the transfer of the water with nitrites/nitrates to the anoxic zone for the denitrification process). The air will be introduced in the aerobic zone via blowers and distributed uniformly by diffusers with elastic membrane.

The wastewater treatment process will be finalized inside the final settlement tanks that have the role to retain the biological sludge produced inside the activated sludge tanks according to the principle of gravimetric sedimentation process. The settled treated water will be discharged by gravity to the Raul Mare River. The sludge settled inside the settlement tanks will be lead to a pumping station, most of it will be re-circulated in the aeration tanks, and the surplus sludge will be transferred to the sludge facility. Here, the sludge will be dewatered and thickened by using poly-electrolyte which has the role to efficiently enhance the sludge dewatering and implicitly reduce its volume

The dewatered sludge will be transported to the Sibiu-Mohu wastewater treatment plant. In case of emergency, if the sludge cannot be transported, it will be temporarily stored of the drying beds built for this purpose.

Wastewater features, discharge requirements and required treatment efficiency level

Item	Indicator	Influent maximum load [mg/l]	Effluent maximum load [mg/l]	Required treatment efficiency [%]
1.	Biochemical Oxygen Demand(BOD)	273	25	90.1
2.	Total Suspended Solids (TSS)	318	35	89,0
3.	Chemical Oxygen Demand (COD)	682	125	81.7
4.	Total N	32	15	53.1
5.	Total P	9	2	77.8

The requirements regarding the discharge in the natural emissary are compliant with the technical standard NTPA-001/2002 provisions modified and completes by Governmental Decisions 352/2005 and 210/2007, which were harmonized with the aquis communautaire regarding the environment protection legislation.

From assessing the above mentioned figures and taking into account the fact that the wastewater treatment plant will have a population equivalent higher than 10.000 p.e., it resulted that a plant is needed to provide, besides mechanical-biological treatment also advanced treatment to biologically remove total N and total Phosphorus.

WASTE MATERIALS

During the project construction phase lots of solid waste and debris will be generated - from the building of the new water supply/sewerage networks and of Avrig wastewater treatment plant. These waste materials will be selectively collected and managed by specialized companies.

During the wastewater treatment plant operation, solid waste will be produced and this will be removed at the nearest compliant solid waste storage. The solid waste retained by the screens and by the grit and grease remover will be evacuated from the site together with the domestic solid waste. The stabilized dewatered sludge resulted from the treatment process will be transported to the Sibiu-Mohu wastewater treatment plant for further treatment. All the above mentioned waste is classified as non hazardous waste.

As regarding the sludge, a general strategy at county level has been developed, a viable constructive, economic and environmental solution has been identified, the regional operator has expressed the option to use the sludge for agricultural purposes and to store the sludge at the ecological landfill.

FORECASTED IMPACT ON THE ENVIRONMENT

Environmental factor: Water

This investment does not propose the extension of the source for the drinking water supply as being necessary, it proposes only the extension of the water distribution network, the extension of the sewerage network and the construction of a new wastewater treatment plant. The proposed

investment does not require additional flows from surface or underground sources (the existing water facility is being used), conditions under which the investment has no impact on the hydrological and hydro geological features of the site.

The evacuation of the technological and domestic treated wastewater (appropriately treated), according to the project has no negative impact on the surface water quality, the natural emissary Raul Mare River.

Environmental factor: Air

The pollution sources are divided into potential malodour sources and gas emissions. The gas emissions sources are represented by: biochemical decomposition process, chemical reactions, vaporization.

During the investment execution stage, the potential pollution sources are: dust produced during excavation works, gas emissions from vehicles and different machinery. The impact on the air will be a local one and for a short period of time, the project proposed concrete measures for their mitigation.

During operation, the water supply network may not be considered an air pollution factor. The wastewater networks may generate malodour, in order to limit this, maintenance works are being proposed and also natural ventilation via manholes. As regarding the wastewater treatment plant it is mandatory to strictly control de treatment process for the designed objects, in order to limit the occurrence of the anaerobic process, which may produce malodour, especially regarding the sludge line.

By implementing the proposed measures and by the appropriate plant operation the impact on the air will be minimum.

Environmental factor: Soil and Subsoil

By building this investment objects, the plots of land will be disturbed only locally, as a result of the construction works. It is forecasted a potential contamination with building waste/debris until the works are finalized.

After the wastewater treatment plant commissioning and assuming it will be running appropriately, no changes regarding the soil fertility of the adjacent plots of land will occur. The main risk is represented by the potential infiltrations of the wastewater, because of the inappropriate functioning or bad tightening of the structures containing wastewater and sludge.

Another potential impact may be generated by the storage of the sludge. This impact may represent also a benefit if the sludge is fully compliant with the provisions of legislation in force regarding the sewage sludge in agriculture. The sludge should be used as much as possible for the improvement and maintaining the land fertility in the area.

In conclusion, if the wastewater treatment plant is functioning according to the design data, no environment pollution events are to be expected.

Environmental factor: biodiversity

The rehabilitation and extension works regarding the domestic wastewater network of the Avrig town, the extension of the domestic wastewater network, wastewater pumping station and wastewater pressure pipe from the wastewater pumping station proposed for Mârşa locality are crossing the Special Protection Area ROSPA0098 **– Făgăraş Piedmont** (established according by Governmental Decision no. 1284/2007) covering 27% of the Avrig town area.

In the Avrig–Mârşa area, the site ***ROSCI0132 – Oltul Mijlociu – Cibin- Hârtibaciu*** was also identified in the area, according to Ministrer Order 1964/2007 on setting the conditions for the

protected natural area of the Sites of Community Interest, as a part of the European ecological NATURA 2000 network, site covering 1% of the Avrig town area.

The investment works proposed for the Avrig–Mârşa localities are located in the following way compared to the SCI/SPA locations:

- At a distance of 0.3 km from the Site of Community Interest ROSCI 0132 Oltul Mijlociu-Cibin-Hârtibaciu site;
- Bordering and inside the Special Protection Area ROSPA 0098 Făgăraş Piedmont, at a distance of approximately 50 m of its limit;

The investment works proposed for the Avrig–Mârşa localities include sewerage networks and the building of a new wastewater treatment plant. The wastewater treatment plant is located at a distance ranging 10 and 25 m from the Raul Mare River (Avrig).

The works in the Avrig and Mârşa area, at the intersection point with the Special Protection Area SPA –Făgăraş Piedmont include the building of a wastewater pumping station and a wastewater pressure pipe along the county road connecting the Avrig town to Mârşa locality.

Taking into account the fact that the site ROSPA0098 – Fagaras Piedmont limit is represented by the road track, the proposed works are located inside the site.

These works execution include earthworks which will disturb the vegetal layer in the works locations. This layer will be reinstated at works finalization.

The pollution sources that might have a potential impact on ecosystems *during the building stage* may be the following: site organization, wastewater accidental leakage, domestic and solid waste from building activities.

Measures will be taken in order to protect the ecosystems during the site organization stage, as follows:

- Site organization will be placed outside the site, within 0.5 km of its limits and will be arranged properly in terms of utilities (water, electricity, sanitary facilities and storage places for waste and hazardous materials, according to law.);
- Transport through the site will be made only by using DJ105C county road and DC49 road that connects Avrig to Marsa. These roads are already transited by vehicles so the transport of the equipment used in the execution will have little impact compared with the existing situation.
- Work will be done in phases, according to the project, so that the impact will be minimum. Execution of the water supply and sewage networks will be made within 60 days. Considering the period of 24 months related to the execution of the entire project, this work, near and inside the ROSPA 0098 Fagaras Piedmont, will be scheduled outside the nesting periods of the protected bird species;
- The areas that are excavated along the pipeline route, one 3 m wide band for water pipes and wastewater discharge pipes and 4.5 m wide for domestic sewers, will be disturbed only temporarily and will be reinstated after the installation.

During operation, the project impact on the main environmental factors, such as water, air, soil and subsoil is assessed to be minor, even non significant, on each of the above mentioned factors and the integrity of the SPA Area "ROSPA 0098 Fagaras Piedmont" will not be affected.

The proposed project will not produce any changes related to the woody areas, water bodies, protected areas or habitats of some protected plant species. The proposed project will not produce a negative impact on the local flora, on the populations of the bird, mammal, fish or invertebrate

species.

Social factor

The investment will have a positive influence on the social environment as well on the economic environment.

One of the first positive aspects of the execution of the project is represented by the extension/execution of the water/wastewater networks that will facilitate the connection of the population to water supply/wastewater services, thus the level of comfort and civilization would significantly increase.

The social aspect of this project, is represented by the fact that the population of the area will be positively influenced by the execution of this project by benefiting from a water of appropriate quality, so that the drinking water for the population to be healthy, clean and compliant to the parameters set for the drinking water for human consumption by the legislation in force.

Moreover, the water treatment by using efficient technological processes and the monitoring, both proposed by this project, have a positive impact on the drinking water quality supplied for the population, if the two above mentioned elements will not be provided (efficient treatment process and monitoring) according to the monitoring and sanitary inspection standards, the quality of the supplied water will not be appropriate and compliant.

We would like to mention also the positive impact on the economic environment of the execution of the water supply system, by taking into account the fact that utilities are of utmost importance in the area, especially water supply, for attracting as many as possible investors.

As a result of the building/extension of the wastewater network, the wastewater discharge and accidental leakage will be eliminated by connection a higher population rate to the water collection/treatment services. The soil and the water table pollution because accidental leakage will be decreased to minimum, as well.

The execution of the sewerage network and the possibility to be connected to this network will have an economic positive impact, as well: the investors will be attracted to the area, because the utilities are close to their proposed business activities locations.

Another important social aspect regarding the progress of this project is the fact that it will create new jobs for the population in the area, during execution stage, and also during its monitoring.

Another facility of the designed system is the Avrig wastewater treatment plant which will ensure the wastewater treatment and will allow the effluent discharge in the emissary. It will be built on a location observing the minimum distance to the residential buildings of 300 m, as provided by the legislation in force.

MEASURES FOR MITIGATING THE IMPACT ON ENVIRONMENTAL FACTORS

Environmental factor: Water

In order to avoid the accidental contaminations and mitigation of the environmental factor “water” the following measures will be taken during the *building stage*:

- Optimization of the route of vehicles and machinery transporting the excavated material or building materials;
- Fencing the investment objects starting from the very early building stages;
- Monitoring of the quality of environmental factors all along the duration of the works execution;

- Periodically checking and maintaining all the machinery in a good appropriate technical condition;
- Observing the specific health and safety provisions, as well as the environment protection provisions related to the executed works;

On the other hand, during operation, the designed works regarding the drinking water treatment plant, water supply/wastewater networks, wastewater treatment plant, have tried to ensure the protection of all ground water, by avoiding ex filtrations from the pipes.

These works are mainly the following:

- Perfect tightness of pipes;
- A sufficient slope, appropriate depth and diameters have been provided to ensure the wastewater collection, to avoid any clogging and street flooding;
- Waterproofing of the inspection manholes and wastewater pumping station;
- Clear separation between the water supply/sewerage network;
- Appropriate functioning of the wastewater treatment plant with inclusion of advanced treatment.

Environmental factor: Air

As regarding the air protection, during the *building stage* the provisions of the legislation in force will be observed. The materials will be transported in such a manner not to produce any dust by raising particles in the air, according to each case; the access roads would be watered, according to weather conditions during the execution of works. The measures for mitigation are the following:

- Using vehicles and machinery with low pollution engines;
- Reducing of the idle running time of the machinery engines and vehicles engines;
- Rapid detection of the potential non-tightness or damages and immediate intervention to eliminate their causes;
- Regular watering of the roads where the machinery is circulating, in order to mitigate or fully eliminate the dust pollution.

The technical solutions adopted by the designer for the water supply system are fully compliant with the legislation requirements regarding the polluting emissions level, as well as the ones regarding the total control of the factors that might have an impact on these.

During operation, measures will be taken for reducing the pollution due to emissions in the air by using efficient and appropriate equipment at the wastewater treatment plant.

Environmental factor: soil and subsoil

During the *building stage* all the necessary protection measures will be taken according to technical standards for security in order to avoid the incidental events which could pollute the environment.

Thus, the following for prevention or mitigating the impact must be observed:

- Optimization of the route of vehicles and machinery transporting the excavated material or building materials taken from borrow pits
- Periodically checking and maintaining all the machinery in a good appropriate technical condition
- Measures for avoiding building materials from falling out of the transport vehicle

- Fencing the investment objects starting from the very early building stages
- Sowing with grass seeds and helping the natural regeneration of the non built areas starting even from the building stage
- Shortening of the execution period in order to reduce, thus, the duration of occurrence of the negative effects
- Using of constructive modules that can be easily mounted and dismantled for buildings, roads and other facilities
- Separate storage of the uncovered fertile soil layer
- Monitoring of the waste resulted from the building activities
- Rapid intervention in case of accidental breakdowns to eliminate the causes and reduce the damages
- Collection of all accidental leakage and the ecological reconstruction of the areas likely to be polluted
- Monitoring system of the environment factors during building stage

In order to mitigate the negative effects resulted from the building of the wastewater treatment plant the reinstatement of the plots of land disturbed by the construction activities is required.

In order to prevent a likely impact on soil and subsoil, occurring at the WWTP during the operation of the plant, the following should be taken into account:

- Identification in due time of the breakdowns related to the above mentioned installations and their repair.
- Tightness of the containers used for the temporary sludge storage.

Soil analyses must be performed in order to prevent possible contaminations caused by sludge leakages. Assessment regarding the sludge is required for its storage and/or its use for long term without any environmental risks.

The activities for emergency situations must be planned during the wastewater treatment plant functioning. These must include all the possible emergency situations during plant operation, because of inappropriate functioning of equipment and installations, as well as a result of waste production.

Periodical verifications are needed in order to assess the sludge, its storage and use without generating a negative impact on the environment.

Biodiversity

The measures to protect the flora and the fauna during the *building stage* are to be taken starting from the design and organization stages of the works, in the following way:

- The location of the site organization, production bases and the access road routes are in a such a manner decided in order to generate minimum negative effects on the environment;
- The land plot temporarily occupied during the building must be limited to an area which is strictly needed;
- The non controlled storage of the waste resulted from building activities will be avoided, strictly observing the storage in the places decided by the environmental protection authorities.

The site barracks will appropriately located in areas where no natural eco systems will be affected. The machinery used for the works execution will be compliant to the standards provided by the legislation in force.

In order to reduce the impact produced by the assessed site *during operation*, the beneficiary will take the appropriate measures described in detail in the previous chapters:

- fencing of the area by a protection fence - the elimination of the influence on the

neighboring area is also ensured by planting a vegetal protection belt of the wastewater treatment plant, if this is not provided or if this protection belt is not thick enough;
- ❖ access road maintenance
- ❖ avoiding storing on the ground of different chemicals used for in the water chlorination plant;
- ❖ immediate evacuation of waste of any kind, resulted from the water supply network repair/maintenance activities.

The social and economic environment

The site organization for the works will be in the responsibility of the contractor, who will take the appropriate measures in order to reduce the likely discomfort that might be generated to the dwellings or objectives of public interest, in the following way:

- ❖ using the equipment within their functioning time intervals required for their designed activity;
- ❖ preserving all the technical specifications of all machinery indicated by their producers;
- ❖ using of efficient machinery and dump trucks which will not generate a significant impact on the environment by their exhausted gas;
- ❖ the employees will be periodically medically checked;
- ❖ in order to avoid labour accidents, the labour health and safety provisions will be strictly observed and general specific trainings on the job will be organized;
- ❖ observance of Order no. 536/1997 issued by the Minster of Heath on maximum allowed noise levels for residential districts;
- ❖ observance of technical standard STAS 10009-88, on maximum allowed noise levels for the urban areas.

ALTERNATIVES ANALYSIS

By deciding on the solution for achieving the routes, choosing the materials and technological process for executing the water supply/sewerage networks, more variants have been considered, and the chosen variant was the most advantageous one from the technical-economical point of view. Thus, for the water supply networks, HDPE pipes were chosen and for sewerage networks, PVC pipes were chosen, both being new and resistant materials and with a long service lifetime.

In order to execute the new Avrig wastewater treatment plant, more alternatives have been analyzed, and it was decided that the plant should be built on a new location, this is the most advantageous economical-technical solution, compared to the solution of rehabilitating the existing wastewater treatment plant, or the execution of a new wastewater treatment plant on the existing site.

Technologically, the solution adopted was the one proposed by the Pell Frischmann - Romair Consulting Consortium by using a well known technology in the world with mechanical, chemical and biological treatment stages, as well as with advanced treatment for total N and P removal.

MONITORING

The monitoring of the environmental factors will be achieved during the building stage of the investments objects, as well as during their operation stage.

The environment protection and the monitoring of the project during building stage will be ensured by observing the following requirements:

- the works will be executed in stages, according to the design, so that the generated impact to be

less significant;

- the establishment of plots of land for site organization and for the storage places of the waste generated by building activities will be made by contractors when elaborating their tenders, according to legislation in force, by observing the minimum allowed regulated distances;

- regular checking of the legislation, standards and requirements enforced by the legislation on the execution of the designed works;

- using of an appropriate and efficient equipment, machinery and vehicles, to produce minimum exhaustion gases;

- checking of the locations regarding the accidental wastewater leakages.

In order to supervise the quality of the environmental factors and monitor the activity during operation stage, the following minimum measures are proposed for daily, monthly monitoring the performance of its activity regarding the environment protection, respectively the compliance with the standards enforced by the legislation in force, but not limited to taking the following additional measures:

- periodically monitoring of the drinking water quality at user level;

- periodically monitoring of the subsidence of filling materials on the route of the executed drinking water networks;

- monitoring of the appropriate functioning of the wastewater treatment plant.

We must emphasize that the control monitoring of the drinking water is very important, as it has as an important goal the periodical check of the organoleptic and microbiological quality of the drinking water, as well as the efficiency of the treatment technologies.

The monitoring of the drinking water quality will be performed by the producer, distributor and by the County Public Health Authority. .

During the operation period of the water supply/wastewater collection treatment systems their functioning will be monitored quantitatively and qualitatively, the breakdowns will be detected in real time in order to repair the damages in the shortest time possible in order to reduce the water losses, for environmental protection and for the benefit of the population.

The wastewater treatment plant is provided with a laboratory for analyzing the influent and effluent quality. The equipment is automated and allows an appropriate monitoring of the technological process performance. The own WWTP treatment parameter monitoring system would be able to be connected in the future at the regional operator's SCADA system.

RISKS

Natural risks (flooding, earthquakes) occur independently the beneficiary's will and may lead to accidental pollution.

The risks related to the activities performed are the labour accidents, in order to prevent them the personnel should be trained, provided with protecting equipment and first aid spots.

CONCLUSION

In conclusion, we consider that the project with the following title:

„Extension and modernization of the water and wastewater infrastructure in Sibiu County– Avrig town and Mârşa locality " part of the project „Extension and rehabilitation of the water/wastewater infrastructure in the Sibiu and Brasov Counties",

which was assessed by this Environmental Impact Assessment is fulfilling the proposed objectives ensuring the environment factors protection, improving the water supply/wastewater collection-treatment services, and by ensuring an efficient water source management.

Chapter 13 – RESULTS OF ENVIRONMENTAL IMPACT ASSESSMENT

In Romania, the European Union Directive 85/337/EEC modified through Directive 97/11/EC (EIA) is transposed in Romanian, legislation through:

- EGD no. 195/22.12.2005 regarding the environmental protection approved by Law no. 265/2006, modified and completed by EGD no. 164/19.11.2008
- GD no. 1213/06.09.2006 regarding the establishment of the frame environmental impact assessment procedure for certain public and private projects.

and implemented into the national legislation by the following normatives documents:

- Decision no. 860/26.09.2002 for the approval of the environmental impact assessment procedure and of the issuance of the environmental permit (modified and completed by Decision no. 210/25.03.2004 and Decision no. 1037/25.10.2005).
- Decision no. 863/26.09.2002 regarding the approval of the environmental impact assessment frame procedure methodological applicable guides
- Decision no. 864/26.09.2002 regarding the approval of the environmental impact assessment procedure in cross border context and the public participation in taking decisions in projects with cross border impact
- Decision 794/09.05.2007 regarding the setting up and functioning of the technical analyses group at central level

According to the Decision no. 860/2002 for the approval of the environmental impact assessment procedure and issuing the environmental permit, section 2, article 4

„(1) The competent authorities to issue the environmental permits are the National Environmental Protection Agency, at central level, and regional and local authorities for environmental protection, according to the competences noted in annexes no. I.1 and I.2.

(2) Through impairment of aligniament (1), the ability to issue the environmental agreements approved by Government Decision, according to the present legislation, is taken by the Ministry of Environment.

(3) For projects, activities and/or installations that are to be regulated by central environmental protection public authorities and of the National Environmental Protection Agency could request or delegate the territorial public authority for environmental protection where is the location, case to case, to participate or take over for solving certain procedure stages.

According to the present legislation, depending on the nature and complexity of the Project, of the Project environmental impact, the environmental protection competent authorities may apply the complete procedure of environmental impact

The complete procedure will be applied to the projects considered to have a environmental significant impact. For these it is necessary to accomplish an environmental impact assessment and obtain the Environmental Permit.

The simplified procedure is for projects that have a reduced environmental impact, after taking all the procedure steps the finalisation is the issuance of a Type B Notification .

To all this reasons, the approach in EIA procedures process may be different from a project to other.

The Project “Rehabilitation and modernization of the water supply system and sewerage in Braila County” represents a priority according to the strategy of Sectorial Operational Programme (SOP ENV)

This Project includes investments in those 6 agglomerations from Braila county (Braila, Faurei, Ianca, Insuratei, Viziru, Tufesti) as well as the regional water supply system.

To evaluate the environmental impact the Project “Rehabilitation and modernization of the water supply system and sewerage in Braila County”, depending on the locations of the objectives and on the proposed investments nature, as well as depending on Annex 3 a GD no. 1213/2004, the competent environmental protection authority, that means the Galati Regional Environmental Protection Agency (REPA Galati), process the environmental impact assessment procedure according to the present legislation regarding the environmental impact assessment (EIA).

For this Project the environmental procedure proceeded separately for each one of those 6 agglomerations and for the regional water supply system, taking into account the locations and the different characteristics of these:

- large distances between the investment objectives locations
- the existing situation of water and waste water infrastructure
- hydro – geomorphologic particularities
- projects complexity
- agglomerations socio – economical development

For the regional water supply system and for all those 6 agglomerations proceeds the simplified permitting procedure, according to the screening stage.

Because there were no observations and contestations from the public, based on the screening stage decision there was issued for the beneficiary the TYPE B NOTIFICATION – the project is the objective of the environmental procedure – WITHOUT ENVIRONMENTAL PERMIT with the obligation to finalize the investment, the beneficiary must request the ENVIRONMENTAL AUTHORIZATION.

The Project is included into A2, point 10, paragraph f) and point 13, paragraph a) from GD 1213/2006 regarding the establishing of environmental impact assessment for certain public or private projects.

The decision to grant the environmental notifications type B ware taken by the competent authority, REPA Galati, and the content of the decision was available for public awareness, including the reasons and the conditions to issue the notifications.

The motives that led to the decision are the following:

- the project is included in the category of works with potential environmental impact (GD1213/2006, annex 2)
- project consists of the rehabilitations and modernization of the water and wastewater system
- location of the project is not crossing protected areas or specially hydro-geological protection areas
- no remarks were made by the public

The public was informed regarding the content the screening decision which was made available through announces to the headquarters of the local councils, county council, local environmental agency and beneficiary and no comments were registered from the population regarding the content of the screening decisions and the issuance of the type B environmental notifications.

The Project benefited of a large awareness campaign which in public announcements, debates and meetings.

Therefore the interested public had the opportunity to express the opinion regarding the Project implementation.

All documents provided to the public are presented in Volume VI - EIA.

In order to comply with the notifications issued by REPA Galati it is necessary to ensure the followings:

- works will be set up, in the agglomerations indicated by the projects, by an authorised constructor according to the documentation submitted to the environmental authority (technical specifications)
- works will be set up according to the technical conditions and legal status mentioned in the previous establishing documents, issued by authorities
- the beneficiary is responsible for the correct accomplishment of the proposed works, that are coming with the works from the technical specifications
- in the works execution period will be established parking areas for auto vehicles and needed machinery

- in case of soil accidental pollution with petroleum products mineral oils from heavy machinery and mobile equipment will proceed immediately to contaminated soil removal, storing in bags, treatment by authorised firms / storage to an authorised waste landfill
- it is forbidden to set the site organization in the water supply boreholes area
- will be take into consideration to minimize the storing space for waste resulted in the construction, assembling, demolishing and managing properly these kind of waste by selective collecting and reuse/elimination using authorised firms. The waste resulted from construction and demolishing will be collected and transported by the one that executes the construction or demolishing works or by another person based on a contract, to he places indicated by the authorities
- sludge management resulted from the sewerage and from the treatment of the waste water will be done accordingly to EGD 78/2000 regarding waste policy, with modifications and ulterior completions and Ministerial Order no. 344/708/2004 that approves the technical terms regarding environment protection and especially soil, when is used treatment sludge in agriculture, with ulterior modifications
- the altered fields by accomplishing the Project will be brought to the previous functionality state, by redoing the green areas (where is the case)
- in case of an accident or incident that is strongly affecting the environment will be notified immediately LEPA Braila and REPA Galati
- from the quality point of view the treated water will be included in accordance with GD no. 188/2002, modified by GD no. 352/2005, to approve some norms regarding the discharging conditions for the waste water into the aquatic environment (NTPA 001/2005)
- when the works are finalised will be notified LEPA Braila and REPA Galati, to elaborate the work completion certificate. The work completion certificate elaborated at this stage will be accompanied by the accomplished works reception certificate
- before starting the collecting system and waste water treatment, will be requested and obtained an environmental permit from LEPA Braila, accordingly to the environmental legislation
- in accordance with GD 930/2005 will be taken into account the sever policy from sanitary point of view for water sources, catching works and water supplying installations and the hydro geological protection area
- the notifications do not exclude to obtain the authorisations/permits issued by specialised state institutions according to the legal requests.

For unpredicted situations, the competent authority for environment protection will be notified by the beneficiary.

Moreover, through the requests from the permits issued by Apele Romane / Romanian Waters, the beneficiary is responsible for the adequate functioning of the investments of the projects, relating to preventing water pollution. To fulfil the standards it is necessary for the industrial agents to have with priority pre-treatment when they are discharging in the municipal sewerage.

During the Project implementation REPA, Apele Romane/Romanian Waters and the Environmental Guard will supervise in such manner to fulfil all the conditions and demands from the functioning permits relating to environmental pollution prevention.

The financing plan for the eligible cost is presented in the following table:

Financing Plan:	U.M.	Total	2010	2011	2012	2013
Eligible expenditures	EUR current	(102,046,000)	(14,581,841)	(30,096,920)	(30,939,634)	(26,427,604)
EU Grant	EUR current	80,015,446	11,433,790	23,599,342	24,260,124	20,722,189
State Budget Contribution	EUR current	12,237,656	1,748,697	3,609,311	3,710,372	3,169,276
Local Budget Contribution	EUR current	1,882,716	269,030	555,279	570,826	487,581
ROC Loan	EUR current	7,910,182	1,130,324	2,332,988	2,398,312	2,048,558

Table 1.7-1: Financing plan for eligible cost –EUR (current prices)

1.8 Results of the Institutional Analysis

A thorough assessment of the Institutional issues concludes that the proposed I Institutional arrangements are adequate to assure the sound implementation of the proposed investment project to be financed under the cohesion fund and a sustainable development of the Regional Operating Company, SC Apa Alba CTTA SA. Under the SAMTID Programme, Apa Alba CTTA gained experience in the implementation of projects and have a well focused PIU in place to implement the Project efficiently.

1.9 Results of the Environmental Impact Assessment

Following the EIA legislation, as well as the requirements of the Local Environmental Protection Agency (LEPA) Alba, the Consultant's Environmental Expert elaborated the Technical Memoir for each agglomeration.

The Technical Memoir contains a summary description of the current situation regarding the water and waste water systems of the agglomeration and a detailed description of the proposed investments.

A detailed description of the potential pollution sources, the impact of the described pollutants on the environmental components and the methods and recommendations to avoid or mitigate the impact cover the both phases of the project, the construction (execution) phase and the operating & maintenance phase. A separate chapter is dedicated to the management of waste and chemicals, and measures for minimising the impact, covering also both phases of the project. The Technical Memoir assesses also the impact of the project on the landscape, on the socio-economical environment and historical and cultural heritage.

The EIA documents contains to different degrees of detail, the description as well as the evaluation of the environmental impact expected for each environmental factor.

The conclusions are summarised below for the expected impact during the construction phase and during the operation of the facilities:

- **Emissions into the atmosphere**; will occur during both, construction phase as well as during operation of implemented measures. Emissions expected during the operation of the plants and facilities will remain below accepted thresholds. The air quality status will be kept at a good level, in compliance with the existing regulations, in the conditions of proper use and administration of the materials and equipments for construction/rehabilitation/extension of the treatment facilities, drinking water supply network and sewerage system. Special attention has to be given to the WWTP's subject to construction and the rehabilitation of the WTPs from Petreşti and Sbesel. All wastewater treatment facilities are located in the designated area, generally on the existing location of the WWTPs. The necessary minimum distances are respected to avoid unacceptable noise and odour emissions.
- Compared with the current situation, the implementation of the project will bring a positive impact on the **quality of surface waters** (from the discharge points of WWTPs into the river) and groundwater, due to the proposed investments covering the rehabilitation and extension of the water and waste water systems.
- **Impacts on biodiversity:** The construction/rehabilitation/extension works will be confined to existing roads and will remain limited to existing locations and other legally designated areas. Following the precautions imposed by national norms, the impact of construction or rehabilitation works on flora and fauna is minimised. During the operation period, the impact on flora and fauna will be positive because the treatment of wastewater will improve the effluent quality compared with the existing situation. Nature 2000 Permits were released for all the agglomerations.
- **Impact on soil and subsoil:** Working under the legal conditions regarding the construction/rehabilitation/extension works, the potential impact on soil and subsoil was estimated as being only temporary and minimum. In the long term, after the implementation of the project, due to the rehabilitation and extension of the water and waste water systems, a positive effect on soil and subsoil was deemed realisable due to the minimisation of the infiltrations/ex-filtrations of the pipes.
- **Impacts on human health:** During the construction period, human health will not be affected negatively, because the air and water quality will remain within the legal parameters. The contract documents and the supervision of the works will impose legal norms and regulations on the contractor in this respect. In the long term, during the operation & maintenance period, the impact on human health will be positive because the quality of drinking water will be improved and the comfort of the population will rise due to the connexion to the sewage systems. Benefic impacts will have also the treatment of used water into the rehabilitated and extended WWTPs.

- **Noises and odours:** Noise and odour that are related to emissions of **construction machines** will be limited to a maximum extent. The contractor has to undertake all necessary effort to reduce the nuisance potential during the rehabilitation or extension of sewer networks and the rehabilitation of the WWTPs. Controlling the expected emission of noise and odour during the operation phase of the WWTPs will require maintaining regular operational routines.

Other temporary impacts of a minor importance are expected during construction period and subsequent operation:

- **Aesthetic**: The common aesthetic limitations are expected during construction phase, such as dirty roads. The concerned roads however will be reinstated on a regular basis during construction time.
- **Operational risk management at facilities**: During construction period, the Contractor is obliged by the Tender Specifications and the Contract to respect the operational risk management plan. During the operation period, the Regional operating company will be in charge of the operational risk management.
- **Disturbances during construction**: Apart from the expected impact during operation impacts of different character are expected during the construction phase: the networks will be placed underneath the roads in trenches and will result in disturbance of regular traffic. In exceptional cases trench-less rehabilitation methods will reduce the negative impact on traffic. This will be the case in centre parts of urban areas only. Rehabilitation of treatment facilities will result in occasional emission of dust, noise or other nuisance as described above but will remain of temporary character and limited locally.

The proposed WWTPs are sufficiently remote to avoid the urban areas from being exposed to unacceptable levels of nuisance. **Mitigation measures** will still be necessary to minimise the plant emissions during construction and operation. These measures are both, conceptual means, which assure reliably low levels of emissions and operational means because they oblige the operator to adopt certain measures related to operational routines:

- **Odour control**: The odour emissions are caused by the exhaust air released from the various treatment units such as clarifiers, pump sumps, sludge holding tanks etc. The most critical treatment units are the inflow section, the screens, the grit removal and deposit, the entire sludge line. The units must be operated according to operation manual; covers and doors must remain closed, ventilation and other odour removing appurtenances must be maintained adequately.

- **Noise control**: Noise is produced by the mechanical equipment required for the various treatment steps such as blowers, pumps and pneumatic systems. The specification of the Tender Dossiers will contain restrictions for maximum noise levels at the fence of the WWTP at daytimes as well as in the night. Beside this, there will be a restriction that no mechanical equipment shall be installed outside but within machinery building. The final acceptance tests will involve noise control tests to verify acceptable thresholds.
- **Wastewater discharges**: During the construction period, the effluent quality will not exceed the existing situation of the quality status. A substantial and sustainable positive impact on environment and health is expected after the finalization of the works.

LEPA Alba, after examination of the documentation submitted for each of the components of the project, decided, within the Screening Stage, that the **simplified procedure for the assessment of the environmental impact** should be followed. The simplified procedure ended with the issuance of a "**Decision**" of LEPA describing the investments and the environmental requirements for implementing the project as follows:

- For **Alba Iulia Municipality** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.
- For **Aiud town** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.
- For **Blaj town** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.
- For **Campeni town** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.
- For **Cugir town** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.
- For **Ocna Mures town** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.
- For **Sebes town** the "Decision" of LEPA was issued on 09.07.2009 for all components afferent to this agglomeration.

1.10 Summary of the Procurement Strategy and Implementation Plan

The 11 defined Works Contract packages include 5 Yellow Book and 6 Red Book FIDIC Contracts. Additionally, 2 Services Contracts comprising one TA of the Regional Operator and Project Management, and one Construction Supervision Contract. Further a small Supply Contract is also proposed for machinery and technical equipment like

CHAPTER 13

RESULTS OF ENVIRONMENTAL IMPACT ASSESSMENT

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13 ENVIRONMENTAL IMPACT ASSESSMENT

This chapter shows the results of the **Environmental Impact Assessment [EIA]** procedure, more details are available in Volume V – EIA Report.

13.1 Summary of findings

Following the EIA legislation, as well as the requirements of the Local Environmental Protection Agency (LEPA) Buzau, the Environmental Expert of the Consultant elaborated the Technical Memoir for each agglomeration of Buzau County: Buzau, Râmnicu Sarat, Patârlagele, Pogoanele and Nehoiu.

Having proposed investments for rehabilitation and new wells as water sources, the Technical Memoirs for Pogoanele and Râmnicu Sarat agglomerations were under the competence of the Regional Environment Protection Agency (REPA) Galati.

According with the requests of the Ministerial Order no.860/2002 regarding the approval of the Environmental Impact Assessment Procedure and releasing of the environmental agreement with further addendum and amendments, each Technical Memoir was elaborated following the „Content Norms of the Technical Memoir for releasing the Environmental Agreement (Acord de Mediu). Therefore, the Technical Memoirs for Buzau, Râmnicu Sarat, Patârlagele, Pogoanele and Nehoiu contain:

- General data about the investment project, as: name, location, designer, beneficiary, period of the proposed works.
- Specific information regarding the opportunity of the proposed investments, as well as the scope of the project, main objectives, the importance of the project and the public utility.
- Description of the project: in order to present an entire picture of the necessity of the proposed investments, a summary description of the current situation regarding the water and waste water systems of the agglomeration was done, pointed out also the critical problems existing for each component of the systems. After this presentation, a detailed description of the proposed investments was done.
- An entire chapter, detailed on each environmental component is dedicated to the potential pollutant sources and the environmental protection. A detailed description of the potential pollution sources and the assessment of the impact of the described pollutants on the environmental components (water, air, soil and subsoil, noise and vibration, as well as the protection of flora and fauna, human settlements and other public historical or architectural monuments, etc.) covers both phases of the project, the construction (execution) phase and the operating & maintenance phase. The Technical Memoir assesses also the impact of the project on the landscape and on the socio-economical environment.

The methods and recommendations to avoid or mitigate the impact, proposed by the consultant to be included into the tender documentations are also described.

- Separate chapter is dedicated to the waste and chemicals management, and measures for minimizing the impact, covering also both phases of the project.
- Other two separate chapters are dedicated, first regarding to the measures to be taken for the rehabilitation/restoration of the locations affected by the works to the end of the construction phase and the second chapter, to the measures to be taken for monitoring the quality of the environment components during both, construction and operation phases.
- The plans, maps, technological flow schemes are presented as Annexes into the final part of each Technical Memoir, drawings.
- Small parts of the proposed investments for Pogoanele and Patârlagele Agglomerations are overlapping on the Natura 2000 network; a document describing in detail the relationship of the proposed investments with the protected area was annexed to the Technical Memoir of each agglomeration (Pogoanele and Patârlagele). There are described also the measures to be taken during the construction stage, as well as during the operation and maintenance stage in order to avoid or mitigate the impact to the biodiversity of the protected areas.

13.2 General conclusions

The general conclusions for all agglomerations are summarized below for the expected impact during the **construction phase** and during the **operation of the facilities**:

- **Impacts on the surface water bodies and groundwater.** Following the legal norms regarding the works in construction field, the works that will be done for the rehabilitation and extension of the water supply and wastewater networks, as well as the other more complex works for rehabilitation of WWTPs will have a minimum impact, only temporary on the groundwater and surface water bodies, during the construction phase.
- During the operation phase, comparing with the current situation, the implementation of the project will bring a positive impact on the quality of surface waters (down of discharge point into the river) and groundwater, due to the proposed investments covering the rehabilitation and extension of the water and sewage systems, including the extension/rehabilitation/reconstruction of the Wastewater Treatment Plants (WWTPs).
- **Emissions into the atmosphere** will occur during both, construction phase as well as during operation of implemented measures. The air quality status will be kept at a good level, in compliance with the existing regulations, in the conditions of proper use and administration of the materials and equipments for construction/rehabilitation/extension of the treatment facilities, drinking water supply network and sewerage system. All wastewater treatment facilities are located in the designated area, generally on the existing location of the WWTPs.

The necessary minimum distances are respected to avoid unacceptable noise and odour immissions. Emissions expected during the operation of the plants and facilities will remain below accepted thresholds.

- **Impacts on biodiversity** – The construction/rehabilitation/extension works, generally will confine to existing roads and will remain limited to existing locations and other legally designated areas. Following the precautions imposed by national norms, the impact of construction or rehabilitation works on flora and fauna is minimized. During the operation period, the impact on flora and fauna will be positive because the treatment of wastewater will improve the effluent quality compared with the existing situation. The proposed investments for 3 agglomerations (Buzau, Ramnicu Sarat and Nehoiu) will be done outside of any protected areas. Nature 2000 Declarations of the LEPA Buzau were released for Buzau and Nehoiu agglomerations; for Râmnicu Sarat agglomeration the Nature 2000 Declaration was released by Regional Environment Protection Agency Galati. For Patarlagele and Pogoanele agglomerations there are only few minor works that will be done in the protected areas, as following: a) rehabilitation of the horizontal drainage field in Pogoanele located in ROSCI0103 Lunca Buzaului and b) replacing the existing pipe for discharging the treated wastewater from the WWTP Pogoanele into the surface body receptor Calmatui River (ROSCI Valea Calmatuiului). The detailed description of the areas of works and the assessment of the impact on flora, fauna and habitats during the construction and operation phases were presented as a separate Annexes to the Technical Memoirs. These Annexes were analyzed by experts of Biodiversity Department of LEPA Buzau for Patarlagele agglomeration, and by the experts of the Biodiversity Department of REPA Galati for Pogoanele agglomeration; visits of the areas were done together with the specialists of REPA and LEPA. For both of them, the impact on flora, fauna and habitats were assessed to be minimum and not-significant and only for a short period of time during the construction period. Comparing with the existing situation, there will be a positive impact, taking into consideration the measures imposed to the constructor during the construction phase and also the technical solutions used (non-destructive rehabilitation of the existing horizontal drains field for Patârlagele, and replacing of the treated wastewater discharging pipe from the WWTP Pogoanele), Similar measures, but addressed to the operator in case of any intervention were imposed for the operation phase. Natura 2000 Declaration of the LEPA Buzau was released for Patarlagele agglomeration; for Pogoanele agglomeration Natura 2000 Declaration were released by REPA Galati. It is mentioned again that Pogoanele and Ramnicu Sarat agglomerations were under REPA Galati competence because of their investments regarding the new wells drilling.

- **Impact on soil and subsoil –** Working under the legal conditions regarding the construction/rehabilitation/extension works, the potential impact on soil and subsoil was estimated as being only temporary and minimum. Comparing with the actual situation, on a long term, after the implementation of the project, due to the rehabilitation and extension of the water and sewage systems, a positive effect on soil and subsoil was estimated due to the minimization of the infiltrations/ex-filtrations of the pipes. Extension of the networks under an integrated water/wastewater management concept will bring a positive impact on the quality of soil and subsoil, avoiding the pollution of these environment components.
- **Impacts on human health** – During the construction period, human health will not be affected negatively, because the air and water quality will remain within the legal parameters. The contract documents and the supervision of the works will impose legal norms and regulations on the contractor in this respect. On a long term, during the operation & maintenance period, the impact on human health will be positive because the quality of drinking water will be improved and the comfort of the population will rise due to the connexion to the sewage systems. Benefic impacts will have also the treatment of used water into the rehabilitated and extended WWTPs.
- **Noises and odours** – Noise and odour that are related to emissions of **construction machines** will be limited to a maximum extent. The contractor has to undertake all necessary effort to reduce the nuisance potential during the rehabilitation or extension of sewer networks and the rehabilitation of the WWTPs. Controlling the expected emission of noise and odour during the operation phase of the WWTPs will require maintaining regular operational routines.

Other temporary impact of minor importance is expected during construction period and subsequent operation:

- **Aesthetic –** The common aesthetic limitations are expected during construction phase, such as dirty roads. The concerned roads however will be reinstated on a regular basis during construction time.
- **Operational risk management at facilities –** During construction period, the Contractor is obliged by the Tender Specifications and the Contract to respect the operational risk management plan. During the operation period, the Regional Operating Company will be in charge of the operational risk management.
- **Disturbances during construction** – Apart from the expected impact during operation impacts of different character are expected during the construction phase: the networks will be placed underneath the roads in trenches and will result in disturbance of regular traffic. In exceptional cases trench-less rehabilitation methods will reduce the negative impact on traffic. This will be the case in centre parts of urban areas only. Rehabilitation of treatment facilities will result in occasional emission of dust, noise or other nuisance as described above, but will remain of temporary character and limited locally.

The proposed WWTPs are sufficiently remote to avoid the urban areas from being exposed to unacceptable levels of nuisance.

Mitigation measures will still be necessary to minimize the plant emissions during construction and operation. These measures are both, conceptual means, which assure reliably low levels of emissions and operational means because they oblige the operator to adopt certain measures related to operational routines:

- **Odour control:** The odour emissions are caused by the exhaust air released from the various treatment units such as clarifiers, pump sumps, sludge holding tanks etc. The most critical treatment units are the inflow section, the screens, the grit removal and deposit, the entire sludge line. The units must be operated according to operation manual; covers and doors must remain closed, ventilation and other odour removing appurtenances must be maintained adequately.
- **Noise control:** Noise is produced by the mechanical equipment required for the various treatment steps such as blowers, pumps and pneumatic systems. The specification of the Tender Dossiers will contain restrictions for maximum noise levels at the fence of the WWTP at daytimes as well as in the night. Beside this, there will be a restriction that no mechanical equipment shall be installed outside but within machinery building. The final acceptance tests will involve noise control tests to verify acceptable thresholds.
- **Wastewater discharges –** During the construction period, the effluent quality will not exceed the existing situation of the quality status.
- A substantial and sustainable positive impact on environment and health is expected after the finalization of the works, when the quality of the discharged wastewater will be kept under the values of NTPA 011-001.
- The quality of surface rivers, Buzau and Calmatui, where the treated waste water from the waste water treatment plants of Buzau, Râmnicu Sarat, Patârlagele, Pogoanele and Nehoiu are discharged, will be considerably improved.

The Environmental Impact Assessment Procedure was followed for all five agglomerations according with the requirements of the EIA Directive and Romanian legislation, regarding each step of the procedure and public information/announcements. No comments and observations from the public were received during the legal period of time after this period.

Short description of the procedure: After examination of the documentation submitted for Pogoanele and Râmnicu Sarat agglomerations, LEPA Buzau sent these two Technical Memoirs to the Regional Environmental Protection Agency (REPA) Galati because in Pogoanele and Râmnicu Sarat agglomerations were proposed new wells drilling as groundwater sources. According with the MO 860/2002, in this case the responsibility in developing the EIA procedure is to the level of the Regional Environmental Protection Agency.

Within the Screening Stage into the Technical Review Committee on 30.10.2009, held in LEPA Buzau with a representative of REPA Galati for Pogoanele and Ramnicu Sarat agglomerations, **negative screening decisions** were taken by REPA Galati for these two agglomerations. **Negative screening decisions** were taken in the same meeting of Technical Review Committee on 30.10.2009 held in LEPA Buzau for the agglomerations Buzau, Nehoiu and Patârlagele.

The reasons for the negative screening decisions were detailed into the Minute of Meeting of Technical Review Committee, as well as into the Decisions and Notifications of the Decisions sent to the Operator. There are mentioned below only few of these reasons:

- The works for implementation of the project measures will be done within the legal norms for protection of all components of the environment (water, air, soil&subsoil, biodiversity, etc.); the impact will be insignificant and will occur only during a short period of time and will be limited to the locations of Water Treatment Plants and Waste Water Treatment Plants which generally are far from settlements. The rehabilitation/extension of the distribution or sewage networks will be done successively, with minimum disturbance of the traffic, population and biodiversity.
- The quality of the treated waste waters discharged by the Waste Water Treatment Plants into the river bodies (Buzau and Calmatui) will be according with the norms NTPA 011-001. Comparing with the actual situation, when generally, the waste water is discharged into the rivers un-treated or insufficient treated, the impact for environment will be positive after the implementation of the proposed measures of the project.
- The measures proposed by the project will improve the drinking water quality and will raise water supply cover rate, having a benefit impact to the population health.
- The impact of the proposed measures for the rehabilitation of the drains field Patârlagele on the ROSCI0103 Lunca Buzaului will be insignificant. In fact, fewer than 25% of the lengh of the horizontal drains are located into the ROSCI0103 Lunca Buzaului. The existing drains field will not affect the flow rate of Buzau River because the debit of the river is enough high all four seasons of the year and the biodiversity of the area will not be affected. The proposed works for rehabilitation of the drains will be non-destructive. The potential disturbance will be minimum and only for a very short period of time.
- The WWTP Patârlagele is enough far from the ROSCI0103 Lunca Buzaului and will not affect it. Only a small part of the discharge pipe from WWTP will be located into the ROSCI Lunca Buzaului. Actually, the existing WWTP discharge the waste water untreated. After the implementation of the project, the parameters of the treated waste water will be in compliance with the legal norms and the quality of the discharged waters into Buzau River will be considerable improved. The project will bring a positive impact on flora and fauna of Buzau River comparing with the actual situation.

- The WWTP Pogoanele is far enough from the ROSCI0259 Valea Calmatuiului and will not affect it. Even the discharge pipe from the WWTP Pogoanele to Calmatui River are located for approximately 600m into the ROSCI0259 Valea Calmatuiului, under the conditions imposed by REPA Galati for the protection of the biodiversity, the impact of the project will be reduced and will not affect the habitat and the communitarian species. Actually, the existing WWTP discharge untreated waste water directly into the river Calmatui. After the implementation of the project, the parameters of the treated waste water will be in compliance with the legal norms and the quality of the discharged waters into Calmatui River will be considerable improved. The project will bring a positive impact on flora and fauna of Calmatui River comparing with the actual situation.
- For both agglomerations, Patârlagele and Pogoanele, the works will be done in compliance with the imposed measures for protection of the biodiversity.
- For the agglomerations Pogoanele and Patârlagele, REPA Galati and respectively, LEPA Buzau decided that the assessments under the art. 6(3) were not necessary. The impact of the biodiversity is very low and the integrity of the protected area will not be affected.
- The project will bring a positive impact on flora and fauna of the receiving river bodies when comparing with the actual situation.

13.3 Negative screening decisions

The Negative Screening Decisions issued by LEPA Buzau and respectively by REPA Galati were taken on the basis of the selection criteria from Annexe III of the EIA Directive (transposed into the Romanian legislation in the GD 445/2009), including the characteristics of the project, location and the impact on the environment components.

The Negative Screening Decisions of the Technical Review Committee LEPA Buzau for 3 agglomerations were released as is listed below:

- **Buzau** Decision nr. 309/16.11.2009 of the Technical Review Committee held in 30.10.2009.
- **Nehoiu** Decision nr. 310/16.11.2009 of the Technical Review Committee held in 30.10.2009.
- **Patârlagele** Decision nr. 308/16.11.2009 of the Technical Review Committee held in 30.10.2009

The Negative Screening Decisions of the Technical Review Committee REPA Galati for 2 agglomerations were released as is listed below:

- **Râmnicu Sarat** Decision nr. 336/17.11.2009 of the Technical Review Committee held in 30.10.2009

- **Pogoanele** Decision nr. 335/17.11.2009 of the Technical Review Committee held in 30.10.2009.

13.4 Notifications

The Notifications were issued by LEPA Buzau and respectively by REPA Galati taken into consideration that, during the legal period of time – 10 working days from issuing the Decisions - no comments or objection from the public were received.

The Notifications of LEPA Buzau for 3 agglomerations were released as is listed below:

- **Buzau** Notification nr. 308/07.12.2009.
- **Nehoiu** Notification nr. 309/07.12.2009.
- **Patârlagele** Notification nr. 307/07.12.2009

The Notifications of REPA Galati for 2 agglomerations were released as is listed below:

- **Râmnicu Sarat** Notification nr. 5156/ 8.12.2009.
- **Pogoanele** Notification nr. 5157/ 8.12.2009.

13.5 Declarations Natura 2000

The Declarations Natura 2000 were released by the competent authority responsible with monitoring of the Natura 2000 sites in Buzau County, respectively LEPA Buzau, as is listed below:

- **Buzau** Declaration Natura 2000 of LEPA Buzau nr. 14050/20.11.2009.
- **Râmnicu Sarat** Declaration Natura 2000 of LEPA Buzau nr. 14052/20.11.2009
- **Nehoiu** Declaration Natura 2000 of LEPA Buzau nr.14051/20.11.2009.
- **Pogoanele** Declaration Natura 2000 of LEPA Buzau nr. 14049/20.11.2009.
- **Patârlagele** Declaration Natura 2000 of LEPA Buzau nr. 14053/20.11.2009

CHAPTER 12

RESULTS OF ENVIRONMENTAL IMPACT ASSESSMENT

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LIST OF ABBREVATIONS

ANAR	National Administration “Apele Romane”
ANRSC	National Regulating Authority for Local Public Services
AoM	Association of Municipalities
CF	Cohesion Funds
CFCU	Central Finance and Contracts Unit
CSG	Community Strategic Guidelines
DN	Diameter Nominal
ECJ	European Court of Justice
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EU	European Union
EUR	Euro
FOPIP	Financial and Operational Performance Improvement Programme
GD	Governmental Decision
GDP	Gross Domestic Product
GO	Governmental Ordonance
IDA	Intercommunity Development Association
IFI	International Financing Institutions
INS	Romanian National Institute for Statistics
ISPA	Instrument for Structural Policies for Pre-Accession
IWA	International Water Association
LA	Local Public Administration Authorities
LEPA	Local Environmental Protection Agency
MESD	Ministry of Environment and Sustainable Development
MRD	Maintenance, Replacement and Development Fund
NDP	National Development Plan
NPV	Net Present Value
NRW	Non-Revenue Water
NSRF	National Strategic Reference Framework
NTPA	Normele Tehnice - Technical Norm
OUG	Government Emergency Ordinance
PE	Population Equivalent
PHARE	Initially from Poland and Hungary: Assistance for Restructuring their Economies (PHARE) programme (1989), afterwards one of the three re-accession instruments financed by the EU to assist the applicant countries of Central and Eastern Europe in their preparations for joining the EU.
POPs	Persistant Organic Pollutants
PRGD	Planurilor Regionale de Gestionare a Deseurilor – the Regional Waste Management Plans for the South-East Region
REPA	Regional Environmental Protection Agency
ROC	Regional Operating Company
ROL	Romanian Leu
RON	Romanian New Leu
SAMTID	Small and Medium Towns Infrastructure Development Programme
SAPARD	Special Accession Programme for Agriculture and Rural Development
SCAC	Societata Comerciala Apa Canal Galati
SCADA	Supervisory Control And Data Acquisition
SCF	Structural and Cohesion Funds
SCI	Sites of Community Importance

SGA	Sectia de Gospodarire a Apelor (ANAR) – Sub-branch of NAAR (National Administration Apele Romane)
SN	Sewerage Network
SOP	Sectoral Operational Programme
SOP ENV	Sectoral Operational Programme for Environment
SPA	Special Protected Areas
SR	Romanian Standard
TA	Technical Assistance
TD	Tender Documents
ToR	Terms of Reference
UNDP	United Nations Development Programme
VOC	Volatile Organic Compunds
WB	World Bank
WM	Water Main
WSZ	Water Supply Zone
WSSZ	Water Supply Sub-Zone
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

12 RESULTS OF ENVIRONMENTAL ASSESSMENT

This chapter is a summary of the finding of the separately bound Environmental Impact Assessment [EIA] contained in Volume VI of the Feasibility Study.

12.1 Summary of findings

Following the EIA legislation, as well as the requirements of the Local Environmental Protection Agency (LEPA) Galati, the Consultant's Environmental Expert elaborated the Technical Memoir for each agglomeration of Galati County: Galati, Tecuci, Targu-Bujor, Pechea and Liesti.

Having proposed investments for water main and well rehabilitation as principal potable water sources, the Technical Memoirs for Galati agglomeration were under the competence of the Regional Environment Protection Agency (REPA) Galati.

According with the requests of the Annex no. 5 of the Ministerial Order no.135/2010 (regarding the approval of the Environmental Impact Assessment Procedure and releasing of the environmental agreement with further addendum and amendments) each Technical Memoir was elaborated following the „Content Norms of the Technical Memoir for releasing the Environmental Agreement. Therefore, the Technical Memoirs for Galati, Tecuci, Targu-Bujor, Pechea and Liesti agglomerations contain:

- General data about the investment project, as: name, location, designer, beneficiary, period of the proposed works;
- Specific information regarding the opportunity of the proposed investments, as well as the scope of the project, main objectives, the importance of the project and the public utility;
- Description of the project: in order to present an entire picture of the necessity of the proposed investments, a summary description of the current situation regarding the water and waste water systems of the agglomeration was done, pointed out also the critical problems existing for each component of the systems. After this presentation,
- a detailed description of the proposed investments was done.
- An entire chapter, detailed on each environmental component is dedicated to the potential pollutant sources and the environmental protection. A detailed description of the potential pollution sources and the assessment of the impact of the described pollutants on the environmental components (water, air, soil and subsoil, noise and vibration, as well as the protection of flora and fauna, human settlements and other public historical or architectural monuments, etc.) covers both phases of the project, the construction (execution) phase and the operating & maintenance phase. The Technical Memoir assesses also the impact of the project on the landscape, biodiversity and on the socio-economical environment. The methods and recommendations to avoid or mitigate the impact, proposed by the consultant to be included into the tender documentations are also described.
- Separate chapter is dedicated to the waste and chemicals management, and measures for minimizing the impact, covering also both phases of the project.
- Other two separate chapters are dedicated, first regarding to the measures to be taken for the rehabilitation/restoration of the locations affected by the works to the end of the construction phase and the second chapter is regarding about measures that will be done for monitoring the quality of the environment components during both, construction and operation phases.
- The plans, maps and technological flow schemes are presented as Annexes into the final part of the Technical Memoir, drawings.

12.2 General conclusions

The general conclusions for all agglomerations are summarized below for the expected impact during the construction phase and during the operation of the facilities:

- Impacts on the surface and groundwater water bodies. Following the legal norms regarding the works in construction field, the works that will be done for the rehabilitation and extension of the water supply and wastewater networks, as well as the other more complex works for construction/rehabilitation of WWTPs will have a minimum impact, only temporary on the groundwater and surface water bodies, during the construction phase.

- During the operation phase, comparing with the current situation, the project implementation will bring a positive impact on the surface waters quality (down of discharge point into the river) and groundwater, due to the proposed investments covering the rehabilitation and extension of the water and sewage systems, including the extension/rehabilitation/reconstruction of the Wastewater Treatment Plants (WWTPs).

- Emissions into the atmosphere will occur during both, construction phase as well as during operation of implemented measures. Pollutants emitted during the works execution for the project investment, and activities of extension / modernization of the wastewater treatment plant for the Galati agglomeration could affect residents. Pollutants have a greater intensity in works period and a significantly lower level in execution the pipelines modernization and making connections. The air quality status will be kept at a good level, in compliance with the existing regulations, in the conditions of proper use and administration of the materials and equipments for construction /rehabilitation/extension of the treatment facilities, drinking water supply network and sewerage system. All wastewater treatment facilities are located in the designated area, generally on the existing location of the WWTPs. The necessary minimum distances are respected to avoid unacceptable noise and odor emissions.

- Surface Waters Quality: In construction phase wastewater will result from main areas of work site organization, from works on network, water supply and sewerage installations as well as from wastewater treatment plant. Environmental impacts during construction will be insignificant and it will be only temporary.

- Compared with the current situation, the implementation of the project will bring a positive impact on the surface waters quality (from the discharge points of WWTPs into the river) and groundwater quality, due to the proposed investments covering the rehabilitation and extension of the water and waste water systems.

- Impacts on biodiversity: The construction/rehabilitation/extension works, generally will confine to existing roads and will remain limited to existing locations and other legally designated areas. Following the precautions imposed by national norms, the impact of construction or rehabilitation works on flora and fauna is minimized. During the operation period, the impact on flora and fauna will be positive because the treatment of wastewater will improve the effluent quality compared with the existing situation. Only one of the proposed investments for Galati agglomeration will be done partially inside of Siret River Nature 2000 protected area (well rehabilitation), the others proposed investments (4 agglomeration: Liesti, Tecuci, Pechea , Tg Bujor) will be done outside of any protected areas and the environmental assessment procedure was coordinated by the LEPA Galati (included in the structure of REPA Galati after GD 918/2010). For Galati agglomeration the Environmental Assessment procedure was coordinated by Regional Environment Protection Agency Galati (it was mentioned above that agglomeration were under the REPA Galati competence because of type of investments – wells rehabilitation).

In order to limit the environmental impact of working devices on biodiversity components is recommend to use equipment and machinery with low noise and keeping them in normal use operation and maintenance. In addition to noise reduction, this measure will lead and limit exhaust emissions into the atmosphere.
To eliminate the negative impact on species whose habitat is located near work areas, it is recommended that works to be conducted outside the breeding period, as birds reproduction and amphibians and reptiles reproduction.

After completing the work, is necessary to remove the effects on biodiversity through the impact area: relocation site organization, land rehabilitation and land covered with plant, replanting damaged areas.

- Impact on soil and subsoil – Working under the legal conditions regarding the construction/rehabilitation/extension works the potential impact on soil and subsoil that was estimated as being only temporary and minimum. The potential sources of soil pollution in the operating period could be represented by: waste mismanagement from activity, possible leakage due to plant operation and / or occurrence of accidental pollution.

- In the long term, after the implementation of the project, due to the rehabilitation and extension of the water and waste water systems, a positive effect on soil and subsoil will be done by the infiltrations/ex-filtrations of the pipes.

- Impacts on human health: During the construction period, human health will not be affected negatively, because the air and water quality will remain within the legal parameters. The contract documents and the works supervision will impose legal norms and regulations on the contractor. In the long term, during the operation & maintenance period, the impact on human health will be positive because the quality of drinking water will be improved and the comfort of the population will rise due to the connexion to the sewage systems. Benefit impacts will have also the treatment of used water from the rehabilitated and extended WWTPs.

- Noises and odors: The noise level and odor will vary depending on the type and intensity of operations, such as machines in operation, work mode, number of sources and overlapping arrangement on horizontal and / or vertical, natural or artificial obstacles with screening role. During operation the main noise source of water and sewerage system and wastewater treatment plant is represented by pumps, equipment and technological installations.

The contractor has to undertake all necessary effort to reduce the nuisance potential during the rehabilitation or extension of sewer networks and the rehabilitation of the WWTPs. Controlling the expected emission of noise and odor during the operation phase of the WWTPs will require maintaining regular operational routines.

Other temporary impacts of a minor importance are expected during construction period and subsequent operation:

- Aesthetic and landscape: The common aesthetic limitations are expected during construction phase, such as dirty roads. The concerned roads however will be reinstated on a regular basis during construction time.

- Operational risk management at facilities: During construction period, the Contractor is forced by the Tender Specifications and the Contract to respect the operational risk

management plan. During the operation period, the Regional operating company will be in charge of the operational risk management.

- Disturbances during construction: A part from the expected impact during operation impacts of different character are expected during the construction phase: the networks will be placed underneath the roads in trenches and will result in disturbance of regular traffic. In exceptional cases trench-less rehabilitation methods will reduce the negative impact on traffic. This will be the case in centre parts of urban areas only. Rehabilitation of treatment facilities will result in occasional emission of dust, noise or other nuisance as described above but will remain of temporary character and limited locally.

The proposed WWTPs are sufficiently remote to avoid the urban areas from being exposed to unacceptable levels of nuisance.

Mitigation measures will still be necessary to minimize the plant emissions during construction and operation. These measures are both, conceptual means, which assure reliably low levels of emissions and operational means because they forced the operator to adopt certain measures related to operational routines:

- Odor control: The odor emissions are caused by the exhaust air released from the various treatment units such as clarifiers, pump sumps, sludge holding tanks etc.

- The most critical treatment units are the inflow section, the screens, the grit removal and deposit, the entire sludge line. The units must be operated according to the operation manual; covers and doors must remain closed, ventilation and other odor removing appurtenances must be maintained adequately.

- Noise control: Noise is produced by the mechanical equipment required for the various treatment steps such as blowers, pumps and pneumatic systems. The specification from technical documents will contain restrictions for maximum noise levels at the fence of the WWTP at daytime as well as in the night. Beside this, there will be a restriction that no mechanical equipment shall be installed outside but within machinery building. The final acceptance tests will involve noise control tests to verify acceptable thresholds.

- Wastewater discharges: During the construction period, the effluent quality will not exceed the existing situation of the quality status. A substantial and sustainable positive impact on environment and health is expected after the finalization of the works, when the quality of the discharged wastewater will be kept under the values of NTPA 011-001. The quality of surface rivers receiving the treated waste water from the rehabilitated Waste Water Treatment Plants of the agglomerations in Galati County will be considerably improved.

The Environmental Impact Assessment Procedure was followed for all five agglomerations according with the requirements of the EIA Directive and Romanian legislation, regarding each step of the procedure and public information/announcements.

No comments and observations from the public were received during the legal period of time or after this period.

Short description of the procedure: After examination of the documentation submitted for Galati agglomeration, LEPA Galati sent Technical Memoir to the Regional Environmental Protection Agency (REPA) Galati since it in Galati agglomeration were proposed wells rehabilitation for groundwater sources because the investment area are developed on Galati and Vrancea counties. According with the MO 135/2010, in this case the responsibility in developing the EIA procedure is to the level of the Regional Environmental Protection Agency REPA Galati.

12.3 Screening Procedure

General description

The Screening steps of the Technical Review Committee LEPA and REPA Galati for 5 agglomerations were released as listed below:

The Galati, Tecuci, Targu-Bujor, Pechea and Liesti Agglomerations submitted to the LEPA Galati the documents (notifications) required by Ministerial Order no.135/2010 regarding the approval of the Environmental Impact Assessment Procedure, Annex no. 1: Notification framework content.

The LEPA assessed the documents submitted by SC APA CANAL SA for all five agglomerations and checked the sites for each project.

After that, the environmental authority started and followed the procedure of the Environmental Impact Assessment for all five agglomerations according to the requirements of the EIA Directive and the Romanian legislation. Also, in order to follow each step of the environmental procedure, the LEPA requested SC APA CANAL SA to submit the Technical Memoires and to inform the public by making announcements (newspapers, websites, City Hall).

After the assessment of all five environmental requirements, the LEPA informed SC APA CANAL SA that it is necessary to provide additional information to the Technical Memoir of the Galati Agglomeration. Moreover, viewpoints/notifications of the administration of the protected area were requested for RO SCI 0178 Padurea Torcesti and RO SPA 0071 Lunca Siretului Inferior.

For the Galati and Tecuci agglomerations, the LEPA requested the stereo 1970 geographical coordinates in order to establish the distance from each component of the project to sites of Natura 2000 Network (protected areas).

Also, for the Galati Agglomeration, the notification mentioned by the Environmental Impact Assessment Procedure was submitted to the LEPA Vrancea.

SC APA CANAL SA published the official announcement as required by the Environmental Impact Assessment Procedure for all five agglomerations.

After the first assessment of the documents, the Galati Agglomeration received the decisions from the Galati and Vrancea LEPAs. The LEPAs informed SC APA CANAL SA that the environmental agreement for the Galati Agglomeration will be issued by the REPA Galati.

The main reason for submitting the environmental request to the REPA Galati was that the project for the Galati Agglomeration had components in both Counties of Galati and Vrancea. During the document evaluation procedure for the Galati Agglomeration, the REPA Galati requested additional information on biodiversity and technical aspects concerning the implementation of the project components.

After the submission of the documents mentioned above, SC APA CANAL SA received the decision issued by the REPA Galati.

Detailed steps of the EIA procedure for each agglomeration:

Galati agglomeration:

- First demand for environmental agreement: 13.09.2010
- Initial evaluation decision: 20.09.2010
- Submission to REPA of the technical memoir: 20.10.2010
- Public announcement of environmental agreement request on REPA website and headquarters: 24.09.2010
- Public announcement of environmental agreement request on beneficiary website, headquarters and "Viata Libera" newspaper: 29.09.2010
- Technical Committee Analyse meeting: 07.10.2010
- Public announcement regarding the negative screening decision on REPA website and headquarters: 12.04.2011
- Public announcement regarding the negative screening decision on beneficiary website, headquarters and "Viata Libera" newspaper: 14.04.2011
- Public consultation – no comments from the public
- Date of issuing the negative screening decision: 20.04.2011

Tecuci agglomeration:

- First demand for environmental agreement: 12.08.2010
- Initial evaluation decision: 18.08.2010
- Submission to REPA of the technical memoir: 14.09.2010
- Public announcement of environmental agreement request on REPA website and headquarters: 21.09.2010
- Public announcement of environmental agreement request on beneficiary website, headquarters and "Viata Libera" newspaper: 22.09.2010
- Technical Committee Analyse meeting: 19.01.2011
- Public announcement regarding the negative screening decision on REPA website and headquarters: 24.01.2011
- Public announcement regarding the negative screening decision on beneficiary website, headquarters and "Viata Libera" newspaper: 28.01.2011
- Public consultation – no comments from the public
- Date of issuing the negative screening decision: 28.02.2011

Targu Bujor agglomeration:

- First demand for environmental agreement: 17.08.2010
- Initial evaluation decision: 25.08.2010
- Submission to REPA of the technical memoir: 14.09.2010
- Public announcement of environmental agreement request on REPA website and headquarters: 21.09.2010
- Public announcement of environmental agreement request on beneficiary website, headquarters and "Viata Libera" newspaper: 22.09.2010
- Technical Committee Analyse meeting: 19.01.2011
- Public announcement regarding the negative screening decision on REPA website and headquarters: 24.01.2011
- Public announcement regarding the negative screening decision on beneficiary website, headquarters and "Viata Libera" newspaper: 28.01.2011
- Public consultation – no comments from the public
- Date of issuing the negative screening decision: 28.02.2011

Pechea agglomeration:

- First demand for environmental agreement: 17.08.2010
- Initial evaluation decision: 25.08.2010
- Submission to REPA of the technical memoir: 14.09.2010
- Public announcement of environmental agreement request on REPA website and headquarters: 21.09.2010
- Public announcement of environmental agreement request on beneficiary website, headquarters and "Viata Libera" newspaper: 22.09.2010
- Technical Committee Analyse meeting: 19.01.2011
- Public announcement regarding the negative screening decision on REPA website and headquarters: 26.01.2011
- Public announcement regarding the negative screening decision on beneficiary website, headquarters and "Viata Libera" newspaper: 28.01.2011
- Public consultation – no comments from the public
- Date of issuing the negative screening decision: 02.03.2011

Liesti agglomeration:

- First demand for environmental agreement: 17.08.2010
- Initial evaluation decision: 25.08.2010
- Submission to REPA of the technical memoir: 14.09.2010
- Public announcement of environmental agreement request on REPA website and headquarters: 21.09.2010
- Public announcement of environmental agreement request on beneficiary website, headquarters and "Viata Libera" newspaper: 22.09.2010
- Technical Committee Analyse meeting: 19.01.2011
- Public announcement regarding the negative screening decision on REPA website and headquarters: 27.01.2011
- Public announcement regarding the negative screening decision on beneficiary website, headquarters and "Viata Libera" newspaper: 28.01.2011
- Public consultation – no comments from the public
- Date of issuing the negative screening decision: 28.02.2011

All the documents are attached in Annex I to Volume VI – EIA.

12.4 Biodiversity

12.4.1 Influence of project on population and ecology of species

Achieving the intended location of the project and its neighbourhoods, we concluded that this site not provide favourable conditions for nest and feeding, and does not adversely affect the spread of the population in the area.

12.4.2 Objectives for local biodiversity protection

Objectives relating to special protection areas, such as water quality improvement, research and monitoring the biodiversity conservation and flora and fauna protection follow:

- modelling and improvement of hydrological conditions;
- knowledge of ecosystem functioning;
- knowledge of biodiversity;
- supervision morphological processes;
- sustainable exploitation of renewable natural resources and regulating economic activities, especially the traditional ones;

- reconstruction of damaged ecosystems;
- assessing and limiting pollution phenomena and natural and manmade hazards;
- develop and integrate monitoring information system;
- public information and environmental education and the local population;

12.4.3 Predicted impact on protected natural areas

It predicts that the development project of agglomeration Galati:

- Work designed to extend and rehabilitate collection systems and drinking water adduction without significant changes in areas of marshes, wetlands and water bodies.
- Building materials used are inert and do not generate a negative impact on biodiversity.
- Works designed not change the surface composition of woodland species and forest types.
- Works designed not effect the destruction or alteration of habitats and species of flora and fauna included in the IUCN Red List.
- Not occurring changes in species or resources composition due to specific project works execution.
- Rehabilitation provides no influence on resource dynamics and fish species. Not influenced migration routes of birds.
- Works that are made not change or reduce the space for housing, recreation, food, animal growth.
- Rehabilitation and extension of drinking water main pipe and wells catchment areas and modernization works (drilling, excavation) are viewed as remedial works with no Hydro-induced effects. However they may have adverse effects on riparian ecosystems, especially on vegetation. By design these works are not expected to be achieved in critical areas designated by this priority habitat.

Works that are performed near natural protected areas SPA would protecting birds due noise produced during execution. Also, a negative impact, with serious consequences, can occur in situations where work is performed during the reproductive cycle of birds.
Protected species of amphibians and reptiles from SCI sites and natural reserves located in the vicinity of the execution can be affected by noise, exhaust emissions and deterioration of the local area in which work is carried out.
Terrestrial flora species protected under the SCI sites and natural reserves will not be affected by deforestation point necessary to ensure installation work sites, work areas for carrying out the project ranged outside protected areas.

12.4.4 Measures to reduce the impact of biodiversity attributes on

In order to limit the environmental impact of working devices on biodiversity components is recommend to use equipment and machinery with low noise and keeping them in normal use operation and maintenance. In addition to noise reduction, this measure will lead and limit exhaust emissions into the atmosphere.

To eliminate the negative impact on species whose habitat is located near work areas, it is recommended that works to be conducted outside the breeding period, as follows:

- Birds' reproduction, depending on species, may begin in late March, early April and is completed in late June, the first decade of July.
- Amphibians and reptiles reproduction occurs in April, mid July.

After completing the work, is necessary to remove the effects on biodiversity through the impact area: relocation site organization, land rehabilitation and land covered with plant, replanting damaged areas.

12.5 Environmental Authorities

The competent authorities that **coordinated the EIA procedure for all project components** are:

Regional Environmental Protection Agency of Galati (REPA)
Address: Galati, 2 Regiment 11 Siret Street, Jud. Galati, tel. (40)236 460049, fax (40)236 471009, E-mail: office@arpmgl.ro

Local Environmental Protection Agency Vrancea **was** involved in the EIA procedure in relation with Galati agglomeration, because parts of the works are located in Vrancea County.
Address: Focsani, 2 Dinicu Golescu Street, Jud. Vrancea, tel. (40)237 217542, (40)237 216812, fax (40)237 239584, E-mail: office@apmvn.ro

Other statutory consultees with responsibilities in environmental sector and having representatives into the Technical Review Committee were

Galati Environmental Guard
Address: Galati, Str. No Logofat Tautu. 24, Jud. Galati, tel. 0236 311.333, fax 0236 413.170
E-mail: cjgalati@gnm.ro

National Administration "Romanian Water
Address: Bucuresti, 6 Edgar Quinet Street, tel. (40)21 3110298, (40)21 3110396, fax: (40)21 3123738 http://www.rowater.ro

National Administration "Romanian Water" – Prut Barlad Water Branch
Address: Iasi, 10 Vascauteanu Street, Jud. Iasi , tel. (40)232 218192, fax (40)232 213884,
E-mail: dispecer@dap.rowater.ro

Galati Directorate for Public Health
Address: Galati, 177 Brailei Street, Jud. Galati , tel. (40)236 463704, fax (40)236 464060, E-mail: dspj.galati@upcmail.ro

Galati Inspectorate for Emergency Situations
Address: Galati, 36 Mihai Bravu Street, Jud. Galati , tel. (40)236 460212, fax (40)236 460645, E-mail: http://www.isujgalati.ro , isugalati@gmail.ro

Galati County Council
Address: Galati, Str. Heroes, no. 7, Jud. Galati, tel. Fax 411 044 0236 0236
E-mail: cjg ¬ _arhitectsef@yahoo.com

Galati City Hall
Address: Galati, Str. Royal no. 38, Jud. Galati, tel. 0236 307799, fax 0236 307797 E-mail: arhitectsef@primaria.galati.ro

Sanitary Veterinary and Food Safety Inspectorate
Address: Galati, Headquarters: Str. No. Caesar. 8 Bis, Jud. Galati, tel. 0236 412123, 0236 479393
E-mail: dsvgalati@yahoo.com

Galati Prefecture
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Galati Labor Inspectorate
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Galati County Department of Building Control
Address: GALATI str. Alexandru Cernat nr 1., E-mail: galati@isc-web.ro

The responsible authority for issuing of Natura 2000 Declarations for all agglomerations included in the project is **REPA Galati**

12.6 Negative Screening Decisions

The projects components were subject of screening procedure (as part of EIA procedure), using the criteria from Annex III of EIA Directive.

Prior of issuing the final Negative Screening Decisions, the Water Approvals (attached in Annex III to Volume Vi-EIA) for each agglomeration were requested and submitted to the environmental authority.

The reasons for issuing the NSD are the following**:**

Galati agglomeration:

Project characteristics – parts of the proposed works for tertiary treatment stage were evaluated when the environmental approval was given for previous ISPA project;

The use of natural resources – for potable water purpose, 13% from the total request of raw water will be used from wellfields and 87% from surface water;

The generated waste will be managed in an environmental sound according with the national legislation and Sludge management Strategy;

The pollutant emissions, inclusive noise and other discomfort sources, will be reduced during construction;

The probability of the impact during the implementation period is low, and is only a temporary impact;

Appropriate assessment screening procedure concluded that the works will not affect the sites included in Natura 2000.

Tecuci, Targu Bujor, Pechea and Liesti agglomerations

The use of natural resources will be limited at mineral aggregations and fuels for the construction stage, and for the operation stage will be used non-pollutant energy sources as for example natural gas as fuel and electric energy.

The generated waste will be managed in an environmental sound according with the national legislation and Sludge management Strategy.

No pollutants will be released in the receiver water bodies (Dunare, Siret, Barlad, Chineja and Suhurlui rivers), because through the technology proposed the treated waste water will comply with NTPA 001/2005.

The probability of the impact during the implementation period is low, and is only a temporary impact. The impact on the operation stage will be a positive one, in benefit of the population health and protection environment and the situation will be considerably improved after the implementation of the project, comparing with the actual situation.

Appropriate assessment screening procedure The works in the protected areas will be limited to replacement of some existing components without including new buildings or extensive activities.

12.7 Inclusion in SOP

The projects are not part of the Sectoral Operational Programme Environment.

12.8 Mitigation measures for works in the vicinity of Natura 2000 sites

Monitoring biodiversity in the project area - "The expansion / modernization of water and sewerage networks, building/upgrading water treatment plants and wastewater treatment plant" in Agglomeration of Galati, Galati County
To highlight the impact that investment can generate to the flora and fauna, it must achieve the biodiversity monitoring, by drawing up a monitoring plan in Table no. 1.

Table no. 12.1 - Biodiversity Monitoring Plan

Environmental factor monitored	Parameters monitored	Purpose
Biodiversity	Monitoring of flora Data on the structure biocenosis - vegetation type - rare species - vascular plants Data about biocenosis - population dynamics - relationship herbivores/plants - phenology - expansion/regression Impact on biocenosis - anthropogenic activities - climatic factors - Conservation	Obtaining information on: - preservation of species and habitats; - assessment of measures conservation of species and their habitats; - follow the evolution of biodiversity in protected areas to maintain their ecological integrity.
	Monitoring wildlife Data on the structure biocenosis - Animal communities - rare species, endemic - a distribution - morphology Data about biocenosis - migration, expansion /	

	regression - relationship herbivores / plants - hibidrizare Impact on biocenosis - climatic factors, pollution - food resources	

Biodiversity monitoring plan will provide a basis for a period of time assessing the status of biodiversity in the area and the effect that the protection measures they have implemented. Monitoring involves the evaluation of both the condition of biodiversity in the area, as well as the impact by making the investment. During the conduct of works in the project "Expansion/modernization of water and sewerage networks, building/upgrading water treatment plants and wastewater treatment plant in Galati Agglomeration", Galati County may be affected by some environmental factors, including biodiversity (flora or fauna), for which it should be monitored during project: construction, operation and decommissioning.

Monitoring of flora. The methods used will have character recognition, inventory of the types of vegetation, species and area of interest will be:

- Inventory of flora in the targeted area and surroundings;
- Collection of plant material for species difficult to identify directly on the ground;
- Making photo images to determine the taxonomic identity or, as appropriate, to identify in the laboratory using specialized determinates;
- Identification of habitats, plant associations based on characteristic species;
- Determination of collected materials, verification of species identified in the field, carrying out the list of Plants.

Inventory of plant species in targeted areas will be made on the transects so traveling is covered an area as possible. Following the field visits will be complete inventory of the flora and perform regularly (2-3 days / month during the growing season), so be surprised at all stages of vegetation and many species as possible. It also will record data on plant phenology. Sheets Field observations will include: systematic data of species abundance, dominance, phenology, etc. as indicated in Table. 12. 2 below

Species	Taxon	Abundance	Dominant	Phenology	Observations

Preferable to carry out monitoring of the fauna for a full year (calendar year), especially targeting the vernal and summer seasons.

Monitoring wildlife. For proper monitoring of the fauna will be drawn up a plan, and this work will include methods for monitoring perimeter frontage so that they can ensure continuity of data collection and correlation with existing ones. This area will highlight all the features and details of the populations of animals present at the site, according to the taxonomic group they belong and the time when they are present. In this regard the monitoring of the location of the investment will be structured to accomplish all the requirements of taxonomic groups in each hand, as shown in Table. 12.3.

Table 12.3 - Plan on-site monitoring of the fauna

MONITORING PLAN		
TAXONOMY GROUP	**PURPOSE**	**NOTES**
Amphibians,	Monitoring herpetofauna present at	Monitoring species of

Reptiles	the site; Monitoring species of amphibians and reptiles on land adjacent;	amphibians and reptiles on land adjacent to, identification of wild land in amphibians and reptiles in their periods of maximum activity (April-September).
Poultry breeding	Monitoring breeding bird species within the site; Monitoring breeding bird species in the surrounding areas.	Registration avifauna in various aspects of seasonal (May-June). Identification of livestock, the distribution of species, number of breeding pairs/nests, etc..
Passage bird	Species of bird migration monitoring in the area of operation; Monitoring of wild migratory birds in the surrounding areas.	Monitoring of wild migratory birds in the surrounding areas, observation of the passage of species migration in spring (March-April) and autumn (September-November). Identification of livestock species, their location, etc.
Birds winter guests	Monitoring of bird species winter guests at the site studied; Monitoring bird movements winter guests in the surrounding areas.	Identification of species of birds during winter guest winter (December-March). Location, herd, the displacements of species, etc.

Since water from the wellfields (Vadu-Rosca and Salcia-Liesti wellfields) site is within the special protection ROSPA0071 Siret Valley Lower birds and fauna, particular attention will be given to monitoring species birds, especially those for which the area was declared protected.

Table 12.4 – Periods for monitoring of biodiversity

	January	February	March	April	May	June	July	August	September	October	November	December
Poultry breeding												
Sedentary birds												
Birds of passage												
Wintering birds												
Amphibians												
Reptiles												
Mammals												
Terrestrial Invertebrates												

Legend:

Favorable period

The best time

begin to prepare a monitoring plan (see Table. 3 - Plan on-site monitoring of the fauna). This will include data on: during the performance monitoring,

species monitoring, staff recorded the number of breeding pairs/nesting places of concentration of birds (feeding, resting), moving birds, etc.. (See Table. 3 - Plan on-site monitoring of the fauna).

Avifauna monitoring methods
Method fixed points and transects
This method involves moving in a certain place (point) and recording the birds observed during a certain period of time. The distance between fixed points differs depending on the species of birds. Thus, for small birds in the distance can be up 150 m, and for larger species, more mobile and in particular to study in open ecosystems, the distances ranging between 350-400 m. The number of fixed points of observations varies, requiring a minimum of 50 observation points in a sample (ecosystem).

Example of form for recording data (Table 12.5)

Observation points	Ecosystem	Start time	Distance (min)	Species	Specimens	Height

Using transects involves moving along the observer's point of observation and recording birds on both sides of the transect.

Transects positioning is not depending on certain parts or you prefer the observer (eg. along trails, a river bank, etc. Which seems to have many birds), they are positioned without regard to distribution of birds. In such case, the data and observations can be extrapolated to other sectors of the same ecosystem. Length of transects depends largely on the time required to estimate a sample, as well as the number of ecosystems investigated.
Longest journey of an observer in a day should not exceed 10 km. For more detailed evaluations are recommended about 4 km transects.

Example of form for recording data (Table 12.6)

No. transect	Ecosystem	Species	Exemplary	Angle	Distance	Height

Count on or near concentrations of birds
Counting birds in places of rest and usually involve counting colonies of birds all product usage options, those that come and go from the shelter. Distance from observer to the shelter will also vary: in general the bigger the shelter, the observers must stay on to avoid being overwhelmed by the birds that will count. It can cover the entire circumference of the circle or a portion of it. If he should be known that the proportion of the entire circumference is covered.

Counting/search nests
An ornithological study and may focus their nests because their availability may limit population size and characteristics of the species and then the nests are relatively easy to find. Behaviour of birds (return to the nest, games and wedding song) can be used to calculate the number of pairs in the area.

Counting bird's nests limited to:
- Identify the characteristics of nests;
- Systematic counts of nests in different habitats (trees, soil, vegetation, floating, banks, construction, etc.).

- Calculating the number of nests per unit area (e.g. nests/km^2).

Duration performing monitoring, preferably - a year. This is necessary to contain all aspects of life bird phenology (seasonal observations). Whenever changes may occur in natural conditions or new anthropogenic interventions that may change the results.

Data collection will cover the main aspects:

- Recording weather conditions (temperature, cloudiness, wind, rain, fog);
- Determine all anthropogenic influences exerted on birds in the area;
- Inspecting the monitoring area, depending on the characteristics of impact on the species of birds, the conditions imposed by the Environmental Authority;
- Observing and recording the birds seen in the area of the site. It will be noted for each bird/poultry group noted the following data: observation time (date and time), species, number of copies whereabouts birds on-site observation distance, flight direction, flight height, bird behaviour (feeding, resting), etc. number of nests identified.

Everything shall be correlated with weather and other influences (natural or man) suffered by the populations of birds in the area monitored.

Interpretation of data. At the end of the study will organize and complete database and data obtained will be processed. Based on these conclusions may be drawn regarding the impact of avifauna caused by investment objective.

Responsibility for developing, coordinating and monitoring implementation of the plan is for the investor, which has the obligation to contract specialized services, ie qualified to assess the quality of biodiversity elements, that are to be monitored.

Monitoring reports will be presented biannually/annually, depending on the conditions imposed by the environment.

12.9 Accession Treaty Provsions

Romania's commitments arising from the negotiation process of Chapter 22-Environment, for the water and wastewater are provided in the legislation transposing the European Directives in Romania.

Council Directive 91/271/EEC concerning urban waste water treatment as amended by: Commission Directive 98/15/EC, is the legal basis of Community legislation on waste water . Objectives refer to environmental protection against the adverse effects of discharges of urban waste water and waste water from certain industrial sectors.

In order to implement and comply with the Council Directive 91/271/EEC concerning urban wastewater amended by Commission Directive 98/15/EC, Romania obtained transition periods for:

Urban waste water collection, as follows:
• 31 December 2013, compliance with the directive will be achieved in agglomerations with more than 10,000 PE;
• 31 December 2018, compliance with the directive will be achieved in agglomerations with more than 10,000 PE;
Urban wastewater treatment and disposal:
• 31 December 2015, compliance with the directive will be achieved in agglomerations with more than 10,000 PE;
• 31 December 2018, compliance with the directive will be achieved in agglomerations with more than 10,000 PE

In order to implement and comply with the Council Directive 91/271/EEC concerning urban wastewater amended by Commission Directive 98/15/EC, the County of Galati obtained transition periods for:

- **Galati Agglomeration**: the transition period until 2013 for sewage network and rehabilitation of wastewater treatment plant to 2015;
- **Tecuci Agglomeration:** the transition period until 2013 for sewage network and rehabilitation of wastewater treatment plant to 2015;
- **Pechea Agglomeration:** the transition period until 2013 for sewage network and rehabilitation of wastewater treatment plant to 2015;
- **Liesti Agglomeration** the transition period until 2013 for sewage network and rehabilitation of wastewater treatment plant to 2015;
- **Targu – Bujor Agglomeration:** the transition period until 2013 for sewage network and rehabilitation of wastewater treatment plant to 2018.

CONTENT

TABLES CONTENT

12. RESULTS OF ENVIRONMENTAL IMPACT ASSESSMENT

12.1. INTRODUCTION

The Report of EIA Study was elaborated in accordance with current national environmental legislation regarding EIA procedure, GD 1213/2006 which abrogate GD 918/2002, EO 863/2002 amended by EO 210/2004 and EO1037/2005, European Directive 85/337/EEC amended by EU Directives97/11/EC and 2003/35/EC.

The Report's chapters are in line with the methodological guide as stated in EO 863/2002 (Annex II.2).

The Report of EIA Study is also in line with the recommendations from Suceava Environmental Protection Agency (EPA), resulted from the Technical Memorandum and transmitted by the following addresses no.11577 / 18.10.2010.

The Environmental Impact Assessment identifies, describes and evaluates, with sufficient details, the potential environmental impacts due to proposed investments, and also it is proposing the necessary measures to be applied for minimization of the negative impacts. This study together with the information and participation of interested public, are included in the Environmental Permit issuance procedure.

The Environmental Impact Assessment is assuming the following 3 distinct stages:

- The framing stage of the project in the environmental impact assessment procedure
- Definition of the project domain within the environmental impact assessment procedure
- Quality analysis of the environmental impact assessment report

All these stages are leaded by the environmental authority in charge and are framed in strict time periods.

The initial request assessment made on the basis of Technical Sheet is leading to the request to be included in one of the next categories:

- with insignificant impact – the environmental procedure is not applied
- with reduced impact – a simplified procedure is applied, EIA and Environmental Agreement are not necessary
- with significant impact – the environmental procedure is needed, EIA and Environmental Agreement are necessary.

12.2. EIA FOR THE PROJECT AREA

The "Extension and rehabilitation of water and wastewater infrastructure in Suceava County" is a priority according with POS strategy regarding the environment. This project includes investments in five agglomerations from Suceava County: Suceava, Falticeni, Radauti, Vatra Dornei and Gura Humorului.

For the assessing of the environmental impact in this area, depending on the proposed works types and sites, the Suceava Environmental Protection Agency has developed all specific procedures according to legislation in force regarding EIA.

The EIA procedure was elaborated for each of the five agglomerations, depending on the agglomeration characteristics:

- Proposed investments location
- Hydro-geomorphologic characteristics

- Existing situation of the water and wastewater infrastructure
- Complexity of the proposed investments
- WWTPs capacity (in accordance with GD 213/2006 Art. 8 and Annex 1, Point 9.6, a WWTP with capacity over 150,000 PE represents mandatory subject of EIA. For a WWTP with capacity under 150,000 PE a EIA is necessary only by request from the local authority in charge, according to GD 1213/2006 Art.8 and Annex 2, Point 11.c, similar with the requirements from Annex 1 and Annex 2 of the EU Directive 85/337/EEC amended by Directive 97/11/EC).
- Socio-economic development of the area
- Potential positive and negative impacts on different environmental components, generated by the proposed investments, mainly by the wastewater collecting system and WWTPs.

From this assessment can be concluded that all five agglomerations were framed within the simplified procedure (EIA and Environmental Agreement are not necessary).

The next tables represent a summary of EIA procedure and Environmental Agreement issuance:

Table 1 - Summary of EIA procedure and Environmental Agreement issuance – Suceava

Project Beneficiary	Project name	Location	Procedure Simplified procedure	No./Date
S.C. ACET S.A.	Extension and rehabilitation of water and wastewater infrastructure in Suceava County	Suceava	Environmental Agreement request addressed by the project Beneficiary to the Environmental Protection Agency.	11166/06.10.2010
			Public announcement issued by the Beneficiary regarding the Environmental Agreement request.	12.10.2010
			Record regarding CAT decision about the framing stage and assessment domain completion.	11577/18.10.2010
			Issuance of the Negative Screening Decision	59/28.10.2010

Table 2 - Summary of EIA procedure and Environmental Agreement issuance – Falticeni

Project Beneficiary	Project name	Location	Procedure Simplified procedure	No./Date
S.C. ACET S.A.	Extension and rehabilitation of water and wastewater infrastructure in Suceava County	Falticeni	Environmental Agreement request addressed by the project Beneficiary to the Environmental Protection Agency.	11163/06.10.2010
			Public announcement issued by the Beneficiary regarding the Environmental Agreement request.	12.10.2010
			Record regarding CAT decision about the framing stage and assessment domain completion.	11577/18.10.2010
			Issuance of the Negative Screening Decision	63/28.10.2010

Table 3 - Summary of EIA procedure and Environmental Agreement issuance – Radauti

Project Beneficiary	Project name	Location	Procedure	No./Date
			Simplified procedure	
S.C. ACET S.A.	Extension and rehabilitation of water and wastewater infrastructure in Suceava County	Radauti	Environmental Agreement request addressed by the project Beneficiary to the Environmental Protection Agency.	11168/06.10.2010
			Public announcement issued by the Beneficiary regarding the Environmental Agreement request.	12.10.2010
			Record regarding CAT decision about the framing stage and assessment domain completion.	11577/18.10.2010
			Issuance of the Negative Screening Decision	60/28.10.2010

Table 4 - Summary of EIA procedure and Environmental Agreement issuance – Vatra Dornei

Project Beneficiary	Project name	Location	Procedure	No./Date
			Simplified procedure	
S.C. ACET S.A.	Extension and rehabilitation of water and wastewater infrastructure in Suceava County	Vatra Dornei	Environmental Agreement request addressed by the project Beneficiary to the Environmental Protection Agency.	11169/06.10.2010
			Public announcement issued by the Beneficiary regarding the Environmental Agreement request.	12.10.2010
			Record regarding CAT decision about the framing stage and assessment domain completion.	11577/18.10.2010
			Issuance of the Negative Screening Decision	62/28.10.2010

Table 5 - Summary of EIA procedure and Environmental Agreement issuance – Gura Humorului

Project Beneficiary	Project name	Location	Procedure Simplified procedure	No./Date
S.C. ACET S.A.	Extension and rehabilitation of water and wastewater infrastructure in Suceava County	Gura Humorului	Environmental Agreement request addressed by the project Beneficiary to the Environmental Protection Agency.	11165/06.10.2010
			Public announcement issued by the Beneficiary regarding the Environmental Agreement request.	12.10.2010
			Record regarding CAT decision about the framing stage and assessment domain completion.	11577/18.10.2010
			Issuance of the Negative Screening Decision	61/28.10.2010

NON TECHNICAL SUMMARY

EXTENSION AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEMS IN TIMIS COUNTY

RECAS AGGLOMERATION

1.NON TECHNICAL SUMMARY

1.1.PROJECT DESCRIPTION

RECAS AGGLOMERATION

The project will proposed 1 new borehole, rehabilitation of two boreholes, water production facility extension and modernization of water supply system and sewerage, and a new WWTP

The works will be executed with the scope to served 7089 P.E. and will include treatment processes requested by the European Union and by the Romanian legislation.

The work is situated on the territory of the Recas agglomeration that include only Recas locality situated on the Western part of Timis county, with a population of 4659 inhabitants.

The Recaş city is situated on the central part of the Timiş county, on DN 6 Timişoara – Lugoj.

The Recaş city is neighbored to following administrative units of the Timiş county:

- to the North, commune Bogda;
- to the North – West and West, communes Pişchia and Remetea Mare;
- to the South, commune Chevereşu Mare;
- to the South – East, commune Racoviţa;
- to the East, commune Topolovăţu Mare;
- To the North-East, commune Brestovăţ;

2.PROGNOSIS OF THE IMPACT TO THE ENVIRONMENT

2.1.WATER

During **the execution period**, the works for the proposed investments will not have a significant effect on water environmental factor. Eventual pollutions can be favorite by the seasoning rainfall that lead to suspensions in the surface water, waters that can contain organic substances.

Water distribution pipelines will be new made of HDPE, material that gives them a higher resistance in time, reducing corrosion and water losses in the network.

Wastewater pipelines will be made of PVC, water tight so that there won't be any water losses and the wastewater will be treated before discharging into receiving water.

In the **exploitation period**, in case of WWTP, the effluent is a permanently source of polluter discharges into surface waters, but in a controlled way, so that the natural capacity of regeneration of surface waters can be efficient.

The most important part of the project, in case of water resources management refers to water treatment for making it drinkable and sewerage in almost all agglomerations.

Wastewater quantities are based on the water demands, necessary to satisfy population needs. These are based on the evaluation of average consumption per capita and on increasing rate of population in the projected period.

Through the project, there are being taken measures for the reduction of infiltration rate to an adequate level for designing the pluvial and sewerage networks as well as for treatment processes.

In the normal functioning conditions, the impact upon the environment component water will be a positive one, by assuring the treatment of wastewater according to national legislation.

The entire waste water quantity must be treated at the standards requested by the Romanian norms GD No.325/2005(NTPA001/2005) and Direction of EU 271/1995.

Polluter source: Wastewater insufficient treated from the economical agents discharged into the sewers.

During the execution period, the works for the proposed investments will not have a significant effect on water environmental factor. Eventual pollutions can be favorite by the seasoning rainfall that lead to suspensions in the surface water, waters that can contain organic substances.

Water distribution pipelines will be new made of HDPE, material that gives them a higher resistance in time, reducing corrosion and water losses in the network.

Wastewater pipelines will be made of PVC, water tight so that there won't be any water losses and the wastewater will be treated before discharging into receiving water.

During the functioning period, at the DWTP will not exist potential pollution sources of surface waters. The wastewater from the sanitary installations will be collected and discharged in the urban sewerage system.

Wastewaters from the filters cleaning are impermanent and unpolluted. They can be discharged in the sewerage system.

For the reduction/elimination of water pollution risks, following measures are imposed:

Solid wastes , material resulted from excavations, fuels or oils will not be discharged into the rivers. It is recomanded selective collection of wastes for valorification/elimination by authorised firms.

The Contractor will apply procedures and prevention measures for accidental pollution.

The objective commissioning there will be actualized the functioning exploitation and maintenance rules and prevention Plans of accidental pollutions for all components of water supply system and sewerage for all agglomerations.

AQUATIM will accept in the sewerage network only wastewater in accordance with the limits value from NTPA 002/2005.

2.2.AIR QUALITY, NOISE AND VIBRATIONS

The works designed by the rehabilitation and the extension of drinking water supply networks, of sewerage networks and the building of the Wastewater Treatment Plant, does not form an air pollution source.

From the point of view of the impact on the atmosphere, the activities that might form atmosphere pollution sources might be divided in:

For the period of execution works, there are considered following types of sources:

Diffusing emission sources:

- The execution works of boreholes for the replacing/ extension of pipe networks, for the disaffecting and remedy of some structures. The emission sources adequate to the works of rehabilitation and extension of pipe networks are sources with limited functioning in time, the work front being changed during the development of works. Polluters; sild and powder. As a pollution source limited in time, there might be also considered the period when there shall be demolished constructions in the actual Wastewater Treatment Plant. In this period of time there might appear silt and particles in suspension.
- During the functioning of works proposed to be achieved – the activities that might form atmosphere pollution sources are those connected to the circulation and effective treatment of wastewaters.
- The polluters sources of the atmosphere specific to the functioning of the Wastewater Treatment Plant are following: mobile sources – The Wastewater Treatment Plant hasn't in its endowment vehicles, but in the precincts when it is needed, there pass vehicles. They might generate the atmosphere pollution with CO,NO_x, SO_2, unburned hydrocarbons C_mH_n. From this point of view, there might be said that the emissions of polluters are intermittent and take place along the route crossed by the vehicle in the precincts of the station. These emissions take place in the neighborhood of the soil. Order No. 462/1993, regarding road traffic, mention that polluting emissions of road vehicles are limited with preventive character by the technical conditions foreseen at the homologation of vehicles. This operation is done at the registration for the first time in the country, the respective type of vehicle. These emissions are, as well, checked periodically at the technical inspections that are done periodically during the use of the vehicle in Romania.
    - undirected stationary sources
    - due to the treatment activity of proper wastewaters that might be produced by:
        - circulation of waters in the precinct of the station;
        - Sludge disposal on the platform.

Concentrations of polluters in the emission form the process of treatment wastewaters cannot be calculated, because the sources do have no discharge sections. The estimating results is done in the most unfavorable situations.

There are not any installations for the collecting and dispersion of polluters, but they are in very small quantities and do not produce a pollution of the atmosphere.

Thus, it might be concluded that, from the point of view of the environmental factor AIR, the activity on the studied location presents no significant power source.

Although it is appreciated an insignificant impact on air quality, it is recommended to be specified a series of measures for reduction of emissions to minimize the disturbance created, such as:

Maintenance of lorries and equipments according with a repair schedule /periodical revisions.

Assurance of a correct management of waste, including the sludge generated in WWTP.

Daily clean of access roads.

Plantation with greensward of spaces without concrete / existing asphalt between the objects of WWTP for soil fixation and avoiding dust .

Regarding the generated emissions by the mobile sources, these have to respect the actual legislation.

It will impose to the Contractor to use only equipments and vehicles that have technical revisions updated and are inscribe in the legal norms.

It will be imposed to the Contractor a series of protection measures against noise and vibrations in the residential areas.

Imposed measures refer to:

- Minimize and delimitation of work area
- It is forbidden auto driving outside of streaked roads for building yard function (access roads, technological roads).
- All motors of the plants and trucks shall be foreseen with noise dampers. Based on data regarding the acoustic powers of the noise sources, as well as on data presented in the specialty literature, it is estimated that in the area of the work frontal parts in the exploitation activity there are generated noise levels of at most 75 - 80 dB in their immediate vicinity.The values of the noise level are framed into the allowed limits established by STAS 10009/88. Works come from the functioning of plants and do not represent significant vibration sources, the possibility of the propagation of vibrations being reduced.

2.3.SOIL AND SUBSOIL

There is the risk, especially during construction period, of generating accidental losses of fuels, lubricants and other chemicals as well as of wastewaters and sludge that might contaminate the soil.

Most of resulted soil from earthworks will be used for reinstalling the initial ground level after constructions will be finished, and the rest of the soil will be transported to the landfill site or will be used as backfill material in the authorized places by the municipality.

The majority of construction works regarding pipelines position will take place along the existing roads. It is anticipated that the excavation works on the pipelines layout and from the proposed construction placements will lead to temporally increase of soil erosion, until vegetation is reinstalled
It will be avoid direct position on the soil of construction materials. The surfaces used for materials storage , empty recipients and wastes will be impermeability previously by using plastic foils, containers, or concrete surfaces/existing asphalt.
It will be assure the functioning organization of building yard enclosures, so that activities to be limited to the design spaces, according to specific work (storage, work space, etc.)
Vegetable soil bed will be removed and disposed in separate piles and will be reinstalled after tranches are refilled, to make possible the reinstall of natural vegetation.
The Contractor will apply procedures and will assure implementation of soil protection measures against eventual accidental or structural contamination.
Repairs to the equipments and vehicles used as well as oil change will be done only in the authorized units.

2.4.WASTES

In the execution period it will result important quantities of wastes compared with exploitation period, especially during the construction works of WWTP's objectives and rehabilitation of DWTP.
The following types of wastes will be generated:

- Asphalt fracture
- Excavation soil
- Sludge resulted from cleaning sewers networks
- Metallic wastes resulted from decommissioning of equipments and installations
- Waste resulted from constructions decommissioning : wood, concrete, masonry

Through the way of managing the waste, it will be achieved the risks reduction for environment and population and quantity restriction of waste eliminated from waste dump disposal

For works execution period the following measures are recommended:

The Contractor will elaborate and implement a complete waste management Plan that will comprise :

- The inventory of all types and quantities of waste that will be produced , including nuisance value ;
- Evaluation of reduction opportunity of generated solid waste , specially of types of toxic or dangerous waste ;
- Quantification of method and responsibles for measures implementation of waste management.

- Electromechanical equipments will be removed from the buildings and cleaned from lubricants and other contaminated substances before being delivered to authorized firms for recycling.
- Waste storage will be made in the places approved by the municipality.
- The excavation soil will be reused as backfill material

Contaminated soil will be considerate waste and will be removed

Vegetable soil bed will be removed and disposed in separate haps and will be reinstaled after the refilling of tranches (if is not contaminated).

Sludge and sand collected during cleaning operation of sewerage system , reservoirs etc, will be treated and dried before evacuation to the authorized storage landfill.

Temporary storage of materials on site will be done in a way as to reduce soil pollution risk and aquifer contamination.

During functioning

Technological wastes

Wastes generated by the activities of collecting and cleaning of waste waters and the way of their management are presented by following:

- waste resulted from cleaning channels and manholes of the sewerage network, code 200303 – it is removed manually and it is eliminated to the depony of the city;
- sludge resulted from the cleaning of waste water, code 190805

The sludge obtained at the wastewater treatment plant is proposed that on **short and average term** it is waste:

1. In the ecological deposit of non dangerous wastes
2. In agriculture – according to the Order 344/2004 for the approval of technical norms regarding the environmental protection and especially of soils when sludge from cleaning is waste in agriculture.
3. Another alternative for the final elimination of sludge would be its use at the closing of the actual waste deposits that aren't conform on the area of the Timis County.

According to the article No. 5 of the Decision No. 856/16 08 2002 wastes generated from the Wastewater treatment plant are framed in Enclosure No. 2 , as follows:

- sludge from the cleaning of waste waters COD 19 08 05;
- residuals from grits COD 19 08 01;
- sand COD 19 08 02;
- Water resulted from cleaning the channels COD 20 03 03.

2.5.BIODIVERSITY

Timis County has a surface of 8.697 sqkm being from the point of view of the extension, the biggest county in the country, having a preponderant plain relief -85%. It is highlighted an area of low plain,

with altitudes between 80 and 100 m, with wet areas in the central Western part and North Eastern part (Plaing of Timiş and the low plain of Mureş, the Plain of Arancăi and the one of Jimbolia) and with an area of Piemont plain with altitudes of 100 – 200 m.

On the Eastern part of the county there is situated the Western part and the South Western part of the Mountains Poiana Ruscăi that are remarked by an abundance of flora and fauna species. The natural vegetation is characterized by the presence on a small scale, of plants from the forest steppe, as well as by a raised frequency of hydrophilic and hygrophilic species in the low plains and river meadows with excess moisture. The Eastern part of the county, occupied by the massif Poiana Ruscăi, is covered from the point of view of the forest vegetation with forests of common oak, forests of beech, in mixture with hornbeam and on the upper slopes of the mountain forests of spruce fir, in mixture with fir tree, sporadic meeting also samples of pine.

At the level of the Timiş County, there were stated following sites NATURA 2000:

Sites of community importance as integral part of the European Ecologic Network NATURA 2000 în Romania, Timiş County, according to the Order No. 1964 from 2007

ROSCI0064 Narrow path of the lower Mureş

Timiş County: Margina (1%)

ROSCI0108 River meadow of the lower Mureş

Timiş County: Cenad (12%), Periam (2%), Sânnicolau Mare (1%), Sânpetru Mare (9%), Saravale (3%)

ROSCI0109 Meadow of Timiş

Timiş County: Buziaş (3%), Chevereşu Mare (17%), Ciacova (5%), Foeni (2%), Ghilad (3%), Giera (1%), Giroc (11%), Giulvăz (4%), Moşniţa Nouă (13%), Pădureni (29%), Parţa (4%), Peciu Nou (1%), Racoviţa (13%), Recaş (1%), Remetea Mare (<1%), Sacoşu Turcesc (5%), Şag (9%), Topolovăţu Mare (<1%)

ROSCI0115 Marsh Satchinez

Timiş County: Biled (1%), Orţişoara (1%), Satchinez (14%), Variaş (2%)

ROSCI0250 Region of Pădureni

Timiş County: Pietroasa (5%), Tomeşti (1%)

The areas with special bird fauna protection as integral part of the ecological network Natura 2000 in Romania, Timiş County, according to GD No. 1284 from 2007.

ROSPA0047 Hunedoara Timişană

Timiş County: Orţişoara (3%)

ROSPA0069 River meadow of the lower Mureş

Timiş County: Cenad (12%), Periam (2%), Sânnicolau Mare (1%), Sânpetru Mare (9%), Saravale (3%)

ROSPA0078 Marshes Satchinez

Timiş County: Satchinez (2%)

ROSPA0079 Marshes Murani

Timiş County: Orţişoara (1%), Pişchia (1%)

ROSPA0095 Forest Macedonia

Timiş County: Banloc (<1%), Ciacova (12%), Ghilad (23%), Giulvăz (3%)

For the project "Extension and modernization of water supply and sewerage systems in Timis County-Recas agglomeration" are proposed measurements for reduction, improvement and conservation of NATURA 2000 site Lunca Timisului.

Wastewater discharge pipeline would cross a portion of approximately 200m Natura 2000 site ROSCI0109 Meadow Timis. Treated wastewater will be discharged into the river Timis.

Data on existing habitats in Natura 2000 site ROSCI0109 Meadow Timis

Location:

Latitude N 450 35 '38"E

Longitude 210 5' 23"

Types of habitats present on site:

Zăvoaie with Salix alba and Populus alba

Species of amphibians and reptiles listed in Annex II of Council Directive 92/43/CEE

1188 Bombina bombina

Species listed in Annex II of Council Directive 92/43/EEC

1130 Aspius aspius

1159 Zingel zingel

2555 Gymnocephalus baloni

1124 Gobio albipinnatus

1134 Rhodeus sericeus amarus

1145 Misgurnus fossilis

1146 Sabanejewia aurata

1149 Cobitis taenia

1160 Zingel streber

2511 Gobio kessleri

Invertebrate species listed in Annex II of Council Directive 92/43/EEC

1032 Unio crassus

4032 Dioszeghyana schmidtii

On the fauna in the area of investment, land habitat includes a large number of species, of which many sedentary, and many forms that appear in this area in winter. Characteristic classes of habitat area will be located where specified type investment rivers, grassland, and artificial land (agricultural). The main pressures are the sources of diffuse pollution, sources of pollution, taking water, recharging groundwater and hydro-morphological changes. The resulting pressure of pollution,be broadcast or point may have direct effect on water resources

through water deterioration. Management of aquatic ecosystems should cover a much larger scale problems than the use of economic criteria for water resources based on knowledge that the management has a reasonable hidrosistem guarantee its renewal and maintenance potentialului.One systemic approach should be based on developing a comprehensive analysis, both technical and ecological and economic, which is part of the scheme, because the influence interventions on ecosystems has often spaces spread and effect while higher than the surface affected by the works or effectuate discharges.

Importance of protecting ecosystems resulted mainly from a few complex reziderate:-providing favorable environmental conditions for humans, especially through quality resources (water, air, soil) and by the social and aesthetic quality, conservation of special importance geofondului prospects in terms of ecological engineering, which involves primarily rescue from extinction of rare species, conservation of resources, vital for man and nature: water, air and sister, who are largely although renewable, are degraded locally, often irreversible . Pathways ecosystem behavior is followed for all those who performed works of any category that inevitably many types of impact on the natural environment.

One of the key objectives of the WFD is to prevent deterioration and improve the condition of terrestrial and aquatic ecosystems because wetlands depend acestea.Conform WFD 'Water is a commercial product but is a heritage to be protected, treated and apparatus as such '. The Water Framework Directive was agreed that Member States must bring water resources to a' good 'in 2015 by taking adequate measures to treat wastewater, industrial wastewater discharges control leading to leakage nutrients and pesticides that affect aquatic ecosystems and freshwater living organisms are threatened. Following are made for discharges must meet the conditions of evacuation, stick to loading with pollutants discharged waste water according to norm Conditions wastewater discharge into the sewage systems in towns and direct treatment plants, NTPA-002/2002 provided in Annex. 2. For youth better control of water quality requires a program to monitor the aquatic environment through analysis that can determine if any pollution.

If these conditions are not met, according ANRSC 'POLLUTER PAYS'.

In terms of manual interpretation of habitats Natura 2000 in Romania (Gaftos et al., 2008) is characterized by the presence of forest floodplain forests dominated by Salix alba, S . fragilis or other willow species related to them by the riverside forest multilayered with Mediterranean and Central Eurasian Populus spp, Ulmus spp, Salix spp, Alnus spp, Acer spp, Tamarix spp, Quercus robur, Q . pedunculi flora, Fraxinus angustifolia, F. pallisiae, creepers. Large poplar species usually dominate the crest of wave by their height, they may be absent or rare in certain plant groups, which are then dominated by species of the genera listed above. Questionable, 91E0 and 92A0 types overlap, because the communities listing white willow definition of both habitats. To avoid any confusion, were included in this habitat only poplar forests, pure or mixed with white willow, which grows on alluvial soils more advanced and have a larger suite of species. Among these is noted that differential Fraxinus angustifolia,

Vitis vinifera subsp. sylvestris, Galium rubioides and some transgressive classes and Querceta pubescentis Querco-Faget, and Ulmus laevis, U. a minor, Acer campestre, Brachypodium sylvaticum, Asparagus verticillatus, A. tenuifolius, A. Officinalis.

According to the habitats of Romania (Doniţă et. Al, 2005) the maintenance of this habitat is very high, covers an area of 48,000 hectares in the country, distributed mainly in the Danube and its tributaries have higher. Found at altitudes ranging from 0-200 m in a climate of about 11 degrees C. phytocoenosis this habitat is erected nemoral European species. Habitat vulnerability is very high, both because of anthropogenic influences and natural. Water composition is more important for herbaceous plants and animal species found in this type of floodplain forest. Species of trees have a greater adaptability and influence changes that would not prove severe, the water system is not immediately noticeable. Furthermore, herbaceous plants and species of threes, but have very high retention capacity chemical substances in water and their purification. WWTP influence on this habitat is negative, pointed, local and average period of time, thanks to the adaptability of species.

Regarding the species of interest for this area and to the Natura 2000 site, their impact will be different depending on the strength of adaptation, vulnerability, their life. It will feel a low potential impact on the species of amphibians, reptiles and fish, and species which are bioindicatoare sensitive to damage to both aquatic and terrestrial. It is anticipated that the impact on these populations will be felt from the beginning of works, both by this man that comes in the area constantly, it exerting more stress on individuals, normally neprovocandu their death.

For this reason we recommend and train workers in terms of environmental legislation, relating to the capture / killing / injuring of protected species.

The fact that the type of habitat to be affected will be affected on a small area of land and favored by the ability amphibians and reptiles displacement favorable surrounding areas, but also because reproductive capacity and the degree of survival of tadpoles (when amphibians), the impact is greatly diminished naturally.

Avoid any method storage / use / disposal of chemicals in or around the water, which could cause an inhibition or against an excess proliferation of reproduction. The species of fish will feel little impact, namely, by disturbare only during the execution of works, especially the younger stages of development cycle.

Thus:

1188 Bombina Bombina - Red bull belly pond - near threatened species, protected by GEO 57/2007, Law 13/1993, the Berne Convention. In Romania, the species is particularly prevalent in the lowlands, unpretentious, alive in every eye water, permanent or temples, ponds and the lowland plains, climbing hills and in the region, at altitudes between 0-400. Species became vulnerable due to habitat degradation, water pollution with different waste, so he wants the management measures to reduce pollution of waterways, deforestation

avoidance as possible, during reproduction prohibition in the early stages of ontogenetic development. We expect a significant point on this species. Besides this species, were also reported presence and other species of amphibians, such as Bufo bufo (toad), Rana arvalis, Rana Dalmatian, Rana ridibunda, with some species degree of protection to national or Community level. Of the species of reptiles that can be affected to some extent more side activities eurare stations, the installation phase, are snakes Natrix natrix, Natrix tessellata and water turtle Emys orbicularis. They will suffer more due to the presence of people carrying out the work, being very well known and unfounded fear of people's negative feelings regarding these species.

Species of fish found in this area will be affected point, consistently leading to their adaptation to new conditions or to a shift in adjacent areas where anthropogenic sresul is felt less. In any case, the negative influence of WWTP will have a much lower level compared with the current situation where all waste water is flow directly into river, chemical substances and wastes in high concentrations, harmful species.

1130 Aspius aspius - rapacious carp - in terms of reproductive biology and behavior, as developed by Doru Lead Sheet Bănăduc, a good part of individuals of this species are withdrawn from the Danube in breeding ponds. The river rises upstream reproducing during which March-April. Aspius aspius (rapacious carp) is a species of interest, protected by GEO 57 on the regime of natural protected areas, natural habitats, flora and fauna. From ecologically, lives in lowland rivers Danube and in hilly, but also in the lake, large and sweet or brackish lakes. The species has a relatively small spread in Romania, but there are no population studies so that a statistical approximation population size of this species. The national territory is considered a species with low vulnerability. Species benefit from the status of protection provided by several national and international laws.

Aspius aspius is present in the following protected areas: the Danube Delta Reserve, Lower Mures Floodplain Natural Park, Park Lower Prut Floodplain Natural Low, Iron Gates Natural Park, Balta Braila Natural Park. The main threats are habitat degradation and lodging places eggs, but also obstacles in migrating species. In terms of Natura 2000 habitats found in this species, mentioned 3140. Strong water benthic vegetation of Chara oligomezotrofe spp species is necessary to protect water quality conservation and prohibition of all interventions that alter the drainage conditions in the riverbed. WWTP impact on the species is negative, point, of short duration.

1159 Zingel zingel - vulnerable species protected by GEO 57/2007. Live constantly in fresh water, the rocky and sandy bottoms, feeding on worms, insect larvae, fish eggs and chicken. During floods need to enter the swamps. Reproduction in April-May, the females depositing eggs on rocky bottoms. Endemic species in the Basin, climbing almost to the middle of the river Prut, Siret, the Olt, Jiu River, Bega River, Somes. WWTP impact on the species is negative, point, of short duration.

2555 Gymnocephalus balloon - prefers sandy and muddy substrates, the waters have a moderate current. Males reproduce the first time in the first or second year of life, ira femelel later in the second, third year of life. According to the IUCN Red List, the species is categorized as "Least concern", not him cunocute threats. Justification for inclusion in this category: widespread species, is known without any disturbing factor. WWTP impact on the species is negative, point, short duration

Gobio albipinnatus 1124 - lives in the Lower Danube and in the lowland rivers with fine sand or clay substrate. Job prefer something more deeper and water currents, avoid areas or standing water faster and oozy bottom. Reproduction occurs between May and June, is widespread in average species in Romania, but no kings large population studies in order to statistically estimate the population size of this species. To protect this species is necessary to preserve the quality and APEOs hydro facilities optimal management according to the needs of this species. Integrated monitoring is recommended beneficial species regularly for at least 2 years. WWTP impact on the species is negative point, the average duration.

1134 Rhodeus sericeus amarus - live exclusively in freshwater, preferring those standing or slow, so the river is found mainly in side arms, but quite frequently and in full power, almost to the mountain rivers. Boarta has a relatively large spread in Romania. The country can be considered as a species has a low vulnerability. WWTP impact on the species is negative point, the short duration.

1145 Misgurnus fossilis - eel - is freshwater species Statt or slow flowing water, in swamps rîspândită by area hills, more rare in lowland rivers. The river is muddy and locates the portions in side arms. Oozy substrate preference and vegetation with a relatively wide spread throughout the country, whose vunerabilitate is low to medium. Drainage and pollution of wetlands may constitute a serious threat to the existence of this species. WWTP impact on the species is negative, point, short duration

1146 Sabanejewia aurata - live in fresh water flowing from the mountain to the plain. Preferred substrate of gravel and sand but meets only in parts sandy. The species is widespread on a relatively flat area in Romania, where it could be considered a species with low vulnerabilitae. WWTP impact on species is negative, point, of short duration.

1149 Cobitis taenia - Zvarluga - lives in slow flowing water with sandy bottom, clay, oozy, less rocky, and in standing waters but generally avoiding the much mud. Reproduction occurs in April to June, both in standing water and flowing. The species has a wide spread in Romania, with the majority population in a favorable conservation status. In order not to degrade the status, it is recommended that water systems maintain stability and quality of current water, groundwater status and standing water. Also, to maintain quality of the physico-chemical water and a water flow during menim networks and water.

WWTP impact on species is negative, point, short duration.

Streber Zingel 1160 - according to IUCN Red List, the species is in the category "least concern", as a species with a large spread, seen in main courses of water, fast currents and rocky substrate. The main threats are created by building dams, which is currently regulated, and pollution. WWTP impact on species is negative, point, of short duration. 2511 gobio Kessler - piggy sand - live in the middle of major rivers at the bottom of the area by the broad snout carp, in some small rivers of living in the lowlands clean, reproducing in June, juveniles form large flocks, which are in water more înceată.este one species widespread in Romania, with low vulnerability. To maintain the status of this species to be protected water quality and sediment and exclude certain sectors of river influence and human impact. **It is recommended beneficiary integrated and regular monitoring for at least 2 years.**

1032 Unio crassus - is a species paleare before very common. Occurs in streams of lowland areas to the mountains, but is reported in standing water. The species has a greater vulnerability in terms of chemical changes of water, juvenilii being sensitive to the concentration of ammonia and nitrogen, the specific composition of rivers in ichtiofaună, degradation of natural habitats. It is recommended to avoid discharges of wastewater, maintaining riparian vegetation, înscopul to prevent introduction of sediments in river.

It also calls for special monitoring beneficiary ECL least 2 years, the species is recognized as a moderate bioindicator water.

4032 Dioszeghyana schmidtii – not considered treatment plant will have an impact on this species.

Works and installation of the treatment plant will not affect or influence the migration route of wild birds or bats. The impact will be felt as it was specified and above the species of fish first, so it is advisable to draw up a monitoring plan by the beneficiary subsequently be approved by local government Authorities species of Community interest. Species fishes are mostly of interest, but the project is of regional interest, and not known fish mortality due to treatment stations is proposed recipient a specialized monitoring for two years, the monitoring plan requiring EPA approval or custodian Timis Site. Monitoring results made available to them. The plan will contain monitoring protocols for species listed in the standard chart of the site ROSCI0109 Meadow Timis, monitoring is done on the area of overlap with the site and close to the point of discharge of waste into the river Timis. Protocols will include the method used to analyze data sampling time, frequency, physicochemical and biological aspects of water. The monitoring plan will include conducting periodic surveys physicochemical wastewater treated, and the rate of water downstream point of discharge of treated wastewater in the envoy, to avoid accidental pollution of the river Timis. Special attention will be given to reproductive periods, deposit their eggs and raising seedlings.

The vast majority of works related to water and sewer systems will be conducted in urban premises. The proposed works will take place along roads and along the routes with the right of way. Real impact on vegetation is anticipated insignificant. Noise produced by the function and circulation equipment and vehicles have a great impact on wildlife, causing limit access to certain areas. The impact will manifest mainly on soil fauna and to a lesser extent the fauna of mammals and birds. The impact on the fauna is occur during the works and is a non-reversible. Decrease time of stress on the elements of flora and fauna is an essential factor in restoring habitats. Potential accidental spills and leaks of pollutants into water courses and training of sediments under the action of rainwater due to increased awareness of soil erosion can lead to achievement levels high turbidity, with negative effects on aquatic fauna.

The project involves a significant improvement of the existing situation by making the process of sewage treatment standards and the EU novels (secondary progressive implementation) of the effluent. The impact on aquatic life of the project component for achieving sanitation and waste water treatment plant is reduced and compared with the existing situation is positive.

In these portions it is necessary to remove vegetation. Given the brief time allotted works real impact on vegetation is expected to be reduced much of the local flora affected by following factors to recover after withdrawal disrupters.

In general, during the execution of works in the discharge pipe is possible occurrence of adverse effects on species in immediate discharge apropiere.Conducta enter a portion of approximately 200 m in Timis Meadow site. These effects may result in withdrawal tendency fauna in adjacent areas, the reason being noise from construction works.

Another potential negative effect of the works of underground pipelines is to mitigate quality temporary habitats in the organization of the site perimeter and working point. In general, if the manufacturer but the minimum measures to reduce these impacts (discovered, preservation and restoration of green cover the areas affected by binding with the same material), degradation of habitats is minimal and totally reversible. The impact on one species will be reduced and in inconvenience if the treatment plant located within a distance of about 6 km from the site mentioned and during its operation, the species listed above will see a migration to other areas.

Wastewater Treatment Plant effluent will have to comply with legislation and it does not cause pollution of terrestrial and aquatic receiving water, also Timis River to conform to the requirements that the effluent quality and wastewater treatment plant will be influential to follow NTPA 002/2005, that wastewater discharged from industrial sewage particular agencies will have to fall in standards. It also can be done and note that there is no sites in the vicinity of protected areas defined in accordance with Law No water. GD 310/2004 and 930 / 09/2005.

2.6.LANDSCAPE

4.

5. BY THE PROMOTION OF THE INVESTMENT THERE IS CHANGED TEMPORARY THE LOCAL LANDSCAPE.

These changes do have a limited period, only for the period of unfurling the exploitation.
At the execution there shall be called the attention by the project – by the proposed execution technology – to totally remake all areas affected by the execution of works to the initial destination.
After finishing works and after putting into operation of the objective, the impact shall be removed and the vegetal carpet in the protection area shall be remade, that increases the aesthetic potential of the objective.

2.7.HUMANE SETTLEMENTS

The achievement of the investment changes and affects positively the social and economical environment by the access to qualitative water, by the discharge of cleaned wastewaters in the receiving waters, by the created working places and by the local taxes that shall reach to the local authorities. The objective shall have no negative impact on the human dwellings, the investment being achieved during the day.

The dwelling area is not affected but temporary, during daytime, by the works for the extension and rehabilitation of the water and sewerage networks.

The tip lorries and plants do have functional parameters assured by the manufacturing factories, are in good functioning conditions and their moving through populated areas is done with reduced speed, such as noise does not exceed the maximum allowable limits imposed by STAS 10009/1988.

6. 3.MEASURES FOR THE REDUCTION OF THE IMPACT

3.1.WATER

For the reduction/elimination of water pollution risks, following measures are imposed:
Solid wastes , material resulted from excavations, fuels or oils will not be discharged into the rivers. It is recomanded selective collection of wastes for valorification/elimination by authorised firms.
The Contractor will apply procedures and prevention measures for accidental pollution.
For the objective commissioning there will be actualized the functioning exploitation and maintenance rules and prevention Plans of accidental pollutions for all components of water supply system and sewerage for Recas agglomeration.
AQUATIM will accept in the sewerage network only wastewater in accordance with the limits value from NTPA 002/2005.

3.2.AIR POLLUTION

Although it is appreciated an insignificant impact on air quality, it is recommended to be specified a series of measures for reduction of emissions to minimize the disturbance created, such as:

Lorries and equipments maintenance according with a periodical revisions.
Assurance of a correct waste management, including the sludge resulted in WWTP.
Access roads daily treated.
Plantation with greensward of spaces without concrete / existing asphalt between the objects of WWTP for soil fixation and avoiding dust .
Regarding the generated emissions by the mobile sources , these have to respect the actual legislation.
It will impose to the Contractor to use only equipments and vehicles that have technical revisions updated and are inscribe in the legal norms.
It will be imposed to the Contractor a series of protection measures against noise and vibrations in the residential areas.
Imposed measures refer to :
Minimize and demarcation of work area.
It is forbidden auto driving outside of streaked roads for building yard function (access roads, technological roads)

3.3.SOIL AND SUBSOIL

It will be avoid direct position on the soil of construction materials. The surfaces used for materials storage , empty recipients and wastes will be impermeability previously by using plastic foils, containers, or concrete surfaces/existing asphalt.
It will be assure the functioning organization of building yard , so that activities to be limited to the design spaces , according to specific work(storage, work space, etc.)
Vegetable soil bed will be removed and disposed in separate ahaps and will be reinstalled after tranches are refilled, to make possible the reinstall of natural vegetation.
The Contractor will apply procedures and will assure implementation of soil protection measures against eventual accidental or structural contaminations.
Repairs to the equipments and vehicles used as well as oil change will be done only in the authorized units.
The sludge resulted from WWTP will be storage temporary on concreted platform and sludge impact of soil will be insignificant.

3.4.BIODIVERSITY

Having regard to this species and habitats mentioned in the area site discharge pipeline are proposed the following measures to mitigate the impact, to remove any representative or even to improve conservation status of habitats and species,

- Execution of the works will be made outside the period of nesting the birds;(march-may months).
- Location of the pipeline will be establish together with the representatives area protected

- Pipeline route in the area protected will be so particular that it need not be the cutting of vegetation woody;
- As a measure to improve the state of preservation of habitat forest Community interest in this path around an area of approximately. 0.5 ha will remove the species Amorpha Fruticosa and will plant 1000 seedlings of poplar black and white, Salix and oak;
- fitting and proper means of measuring the flow of waste water discharged, the registration and flows with facilities for sampling of water for analysis in places well established and systems automated determining the quality of water treated;
- contractor will demarcate work area to prevent/minimize destruction areas plant, will carry out an inventory of trees and bushes to be slaughtered (if needed) and will develop and implement a plan for replanting.
- Groundside plant will be carefully removed and stored in piles will be separated and then after refilling, to enable restoring vegetation;
- Access and technological roads and all areas whose coating plant was damaged, will be appropriate and appear on their original landscape
- After interventions anthropogenic which may disturb the wild, will be undertaken actions by environmental restoration techniques of environmental engineering (restorations, rehabilitations), including restoring layer vegetable groundside.
- Under the plan to prevent and combat at accidental (obligation of entrepreneur), will be any protective measures against pollution of aquatic ecosystems, attention must be granted pollution with suspended solids.
- The roads will be permanent site maintained by laying and spraying water to reduce dust.
- It will avoid direct location on groundside building materials. Areas designed for storage of building materials, the emptying canisters and temporary storage of waste will be impermeable in advance, with foil or polyethylene will use existing platforms concreted or large containers of waste for construction and demolition.
- Location pipeline which will across the site NATURE 2000 will be achieved through a park location indicated by EPA Timis, so as to not be necessary cutting of trees, and the works will be conducted outside the period of nesting the birds.
- The effluent of Waste Water Treatment Plant will have to comply with the law in force and not to produce pollution of ecosystems terrestrial and aquatic of emisar.de such as effluent to comply with rules imposed and quality WWTP influents on sewage will have to comply with NTPA 002/2005, i.e. waste water discharges from sewage especially by the economical agencies will have to abide by the standards in force.

After finishing the investment works, the affected surface shall be arranged and leveled, in order to restore the soil to the agricultural or functional circuit, such as the landscape is not influenced negatively.

3.5.HUMAN SETTLEMENTS

The dwelling area is not affected but temporary, during daytime, by the works for the extension and rehabilitation of the water and sewerage networks and for the new WWTP.

The tip lorries and plants do have functional parameters assured by the manufacturing factories, are in good functioning conditions and their moving through populated areas is done with reduced speed, such as noise does not exceed the admitted limits imposed by STAS 10009/1988

3.6.MONITORING

In the water and sewerage networks rehabilitation area, the proposed monitoring plan for the ***construction phase*** includes the following components: the air quality in the working areas, general monitoring of health, safety and environment management.

The monitoring of the environmental factors, especially regarding the potential effects of the proposed project should be made by an independent body, having the necessary capacity and specialization, and authorized for this activity.

The contract for the implementation of priority projects must provide the following documents:

- Health and safety plan;
- Environment management plan, including intervention plan in case of accidental pollution;
- Intervention plans in case of accident and risk situations.

For the ***operation phase***, a monitoring system is planned for sampling and analyzing the WWTP's effluent on daily basis, in order to ensure the adequate control and the adoption of immediate repair measures in case of deficiencies.

For the WWTP's monitoring program, the influent and effluent are sampled and analyzing at the checkpoints within 24 hours or on regular basis (4 hours).

The monitoring of the following parameters is recommended:

- Influent in the WWTP: pH, suspended solids, biochemical oxygen demand (BOD5), chemical oxygen consumption (COC), ammonium nitrates, nitrites, total phosphorus, fixed residue, extractible substances with organic solvents;
- Effluent in the WWTP: pH, suspended solids, biochemical oxygen demand (BOD5), chemical oxygen consumption (COC), ammonium nitrates, nitrites, total phosphorus, fixed residue, extractible substances with organic solvents, phenols, detergents, chlorides.

The wastewater treatment process will be monitored based on the main physical and chemical parameters, out of which the pH, the suspended solids, BOD5 and COD, and the BOD/COD report are used for the biological wastewater treatment characterization.

In order to ensure the efficient functioning of the WWTP, it will be provided with automated measurement and control installations for:

- Wastewater and sludge flow;
- Liquids levels;
- Pressure in the air pipes connected to the aeration tanks;

- Warning devices for the maximum and minimum levels;
- pH;
- Oxygen dissolved in the aeration tanks;
- NO3 in the aeration tanks.

Monitoring of the air quality in the working areas in order to check the compliance with the labor protection legislation will be realized for the following:

- NH4 and H2S in the wastewater pumping stations of the WWTP. The labor protection legislation stipulates concentrations of maximum 30 mg/m3 for NH3 and 15 mg/m3 for H2S in the working areas.

The noise made by the pumping stations will be measured at the setting into operation and then at least once a year in order to check the compliance with the stipulations of STAS 10009-88.

The information regarding the quantity and quality of the water is recorded in the DWTP as follows:

- Raw water quantities taken into the treatment plant;
- Quantities of treated water supplied to the clients through the distribution network;
- The records of the analysis bulletins regarding the quality of the raw water;
- The records of the analysis bulletins regarding the quality of the water treated in the stages of the treatment and storage process and in the distribution network;
- The records of the analysis bulletins regarding the quality of the discharged water.

Water samplings will be made at minimum every 4 hours in order to determine the parameters: temperature, dissolved oxygen, turbidity, conductivity, free chlorine, iron, nitrites, magnesium, ammonia, organic loads, silicates, phosphates etc.

3.7. RISK SITUATIONS

Potential industrial accidents might take place differently during the execution and exploitation periods.

Potential accidents during the execution period

They are of the type that are produced on the building sites, being generated by indiscipline and by the non-observance, by hired staff, of the rules and norms of work protection and/ or by not using the protection equipments and they are possible to appear in connection with following activities:

- The work with plants and means of transport
- The inner road circulation and the traffic on access roads
- Fire, from different causes
- Dust or gas inhalation
- Landslide from mountainsides or collapse of ditches tranşee
- falling from the height or in excavations
- crushing on falling elements
- drowning at the execution of works on the bank of the river streams.

These types of accidents do not have effects on the environment, having limitated time and space character, but they might produce losses of human lives ir invalidity. They might also have negative economic effects by materials losses and delay of works.

Another category of accidents in this period of time, might take place in connection with local population, which isn't used with traffic concentrations induced by the access roads or in the area, or through localities. They might be also affected by unfinished works or by works that are going to be finished, that aren't signaled or without elements for warning – big excavations, etc. The victims are usually more curious children and the less advised that are attracted by the novelty character of the site, and the most unfavorable period is during days when it isn't worked and the control of the access to the working points is more reduced.

Potential accidents with significant impact on the environment

- Incorrect handling of the chemical substances (chlorine gas tanks) used in the drinking water disinfection process.
- Accidental wastewater discharge in the receiving water, without treatment.
- Cracking of sewerage pipes by discharging the wastewater on the soil.

Measures for the prevention of accidents

These measures must be taken by the general building contractor and by the subcontractors by observing the Romanian legislation regarding the Work protection, the guard against fire, the civil guard and protection, the Regime of wastes and others. There shall be also observed the provisions of the execution projects, of the Laws and of the norms regarding the quality in buildings.

Shortly, the measures make reference to:

- The strict control of the working staff regarding discipline on site:
- The periodical instruction, the wear of the protection equipment

For operation phase the beneficiary must have implemented a plan for prevention and against fire, and to implemented ISO 14001/2004 regarding environmental management system and Occupational Health and Safety Management System (OHSMS), designed to create a safer workplace,

3.8. DESCRIPTION OF THE DIFFICULTIES

At the issuing of the Report for the valuation of the environmental impact of the investment « Extension and modernization of the water distribution network, in Timis County- agglomeration Recas », as environmental assessor, I had a good cooperation with SC EPTISA Servicios de Ingeneria SA Madrid in consortium with WS ATKINS International LTD, general planer, that put at my disposal all data and information needed to the achievement of the present work.

3.9. PROGNOSIS ON THE LIFE QUALITY/LIFE STANDARD AND ON SOCIAL CONDITIONS IN THE COMMUNITIES AFFECTED BY THE IMPACT

Considering that the time when drawing up the locality Recas study population has access to a source of drinking water by inadequate quality, and in terms of system connecting the water supply and sewage system is not as a percentage of 100 percent, the project will have a positive impact on health and living standard of the population in the area project. The project will lead to supply safe of the population, increasing the network connections to the drinking water supplies, connecting people to the sewage network, compliance with requirements Romanian legislation and the European standards in the collection and treatment of waste water.

4. CONCLUSIONS

The investment shall have the technological endowment needed to a good unfurling of the activity, under secure conditions, the planer considering during design and at the choosing of technological plants, the recommendations of normative documents in force.

At the valuation of the impact on the environment, there was waste the Order No. 863/2002 valuation procedures on environmental factors, in relation to the legislation in force for:

- the environmental factor water GD 352/2005, that regulates the values of the indicators at the discharge in the city sewerage and directly into natural receiving water.
- the environmental factor soil Ord. 756/1997, for the approval of the regulation regarding the environmental pollution.
- the environmental factor air STAS 12574-87 Air in the protected areas Quality conditions and Ord. 462/1993 the technical conditions regarding the protection of the atmosphere and methodological norms regarding the determination of emissions of atmospheric polluters produced by stationary sources.
- for the environmental factor biodiversity EO 57/2007 regarding the regime of protected natural areas, the conservation of natural biotopes, of wild flora and fauna.

From the analysis of objectives, it is concluded that during the achievement of the investment the major impact shall be temporary on soil and on the NATURE 2000 site Lunca Timisului it shall be a potential impact if there would not be taken needed measures to the conservation and special measures for the protection of fishes on the site territory.

In this direction, the beneficiary shall take following measures:

- The prevention of the pollution with petrol products, as a result of the functioning of technological plants at digging, drilling and transport.
- There shall be strictly observed the work technology for the prevention of the aquifer pollution of average depth.
- There shall be observed the provisions of the EO 57 /2007 regarding the regime of the protected natural areas, the conservation of natural biotopes, of the wild flora and fauna
- In regards of mobile pollution sources due to the vehicles entered on the perimeter, there were made recommendations for the establishing of clear traffic routes, for the management of parking places, such as to reduce the manipulation time for the proper parking. Under such circumstances, there might be achieved a reduction of the polluting from mobile sources
- For the reduction of the impact on the environment, there must be considered the monitoring of the environmental factors water, air, soil, wild fauna and controlled depositing of domestic waste.

In conclusion there might be underlined, that

• Part of the investment will be done in the Nature 2000 site Timis Meadow, the area with valuable biotopes in terms conservatory manner or preferred areas fishes.

• Transport equipment will be done on an access road to the contractor is obligated to obtain the consent of the local public.

For the species of fish are these recommendations:

• operating in the cleaning station will regularly monitor the quality of treated wastewater in the area of overlap with the site and close to the point of discharge from sewage treatment plant.

• During trigger execution pipeline will avoid accidental discharge of solids in the water depositing.

• operating in the wastewater treatment plant worker staff will be trained on any form of harvesting, catching, killing, destruction or injury the specimens in their natural environment in any stage of their biological cycle, these activities are forbidden territory to carry out the protected area.

• Avoid any method storage / use / disposal of chemicals in or near the water which could cause inhibition or against an excessive proliferation of reproduction..

Environmental Assesor,

Daniela STAMA

Colaborators for Biodiversity Chapter

Dr. Sergiu MIHUŢ
Atestat MMGA R-2- EIM/BM 2007

SC Unitatea de Suport pentru Integrare SRL
Atestat MMDD EIM/BM 2007

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NON TECHNICAL SUMMARY

EXTENSION AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEM IN TIMIS COUNTY

SANNICOLAU MARE AGGLOMERATION

NONTECHNICAL SUMMARY

1. PROJECT DESCRIPTION

SANNICOLAU MARE AGGLOMERATION

The project will proposed 2 boreholes, drinking water treatment plant, water production facility, extension and modernization of water supply system and sewerage, new WWTP for 17.266 P.E. and will include treatment processes requested by the European Union and by the Romanian legislation-tertiary treatment.

The work is situated on the territory of the Sannicolau Mare agglomeration that include only locality Sannicolau Mare, situated on the Western part of the Timis County, with a population of 13 .280 inhabitants.

The Sânnicolau Mare City is neighbored with following communes in the Timiş County: to the West – North West, commune Cenad; to the North, the Republic of Hungaria; to the East and North - East, commune Sânpetru Mare; to the South commune Lovrin; to the South - West, commune Teremia Mare;

The Sânnicolau Mare City is crossed by following access roads: D.N. 6 Timişoara - Cenad; D.N. 59C Jimbolia – Sânnicolau Mare; D.J. 682 Periam – Dudeştii.

2. PROGNOSIS OF THE IMPACT TO THE ENVIRONMENT AND MEASURES FOR REDUCTION

3. WATER

During **the execution period**, the works for the proposed investments will not have a significant effect on water environmental factor. Eventual pollutions can be favorite by the seasoning rainfall that lead to suspensions in the surface water, waters that can contain organic substances.

Water distribution pipelines will be new made of HDPE, material that gives them a higher resistance in time, reducing corrosion and water losses in the network.

Wastewater pipelines will be made of PVC, water tight so that there won't be any water losses and the wastewater will be treated before discharging into receiving water.

In the **exploitation period**, in case of WWTP, the effluent is a permanently source of polluter discharges into surface waters, but in a controlled way, so that the natural capacity of regeneration of surface waters can be efficient.

The most important part of the project, in case of water resources management refers to water treatment for making it drinkable and sewerage in almost all agglomerations.

Wastewater quantities are based on the water demands, necessary to satisfy population needs. These are based on the evaluation of average consumption per capita and on increasing rate of population in the projected period.

Through the project, there are being taken measures for the reduction of infiltration rate to an adequate level for designing the pluvial and sewerage networks as well as for treatment processes.
In the normal functioning conditions, the impact upon the environment component water will be a positive one, by assuring the treatment of wastewater according to national legislation.
The entire waste water quantity must be treated at the standards requested by the Romanian norms GD No.325/2005(NTPA001/2005) and Direction of EU 271/1995.
Polluter source: Wastewater insufficient treated from the economical agents discharged into the sewers.
During the execution period, the works for the proposed investments will not have a significant effect on water environmental factor. Eventual pollutions can be favorite by the seasoning rainfall that lead to suspensions in the surface water, waters that can contain organic substances.
Water distribution pipelines will be new made of HDPE, material that gives them a higher resistance in time, reducing corrosion and water losses in the network.
Wastewater pipelines will be made of PVC, water tight so that there won't be any water losses and the wastewater will be treated before discharging into receiving water.
During the functioning period, at the DWTP will not exist potential pollution sources of surface waters. The wastewater from the sanitary installations will be collected and discharged in the urban sewerage system.

Wastewaters from the filters cleaning are impermanent and unpolluted. They can be discharged in the sewerage system.
For the reduction/elimination of water pollution risks, following measures are imposed:
Solid wastes , material resulted from excavations, fuels or oils will not be discharged into the rivers. It is recomanded selective collection of wastes for valorification/elimination by authorised firms.
The Contractor will apply procedures and prevention measures for accidental pollution.
The objective commissioning there will be actualized the functioning exploitation and maintenance rules and prevention Plans of accidental pollutions for all components of water supply system and sewerage for Sannicolau Mare agglomeration.
AQUATIM will accept in the sewerage network only wastewater in accordance with the limits value from NTPA 002/2005.

4. AIR QUALITY, NOISE AND VIBRATIONS

The works designed by the rehabilitation and the extension of drinking water supply networks, of sewerage networks and the building of the Wastewater Treatment Plant, does not form an air pollution source.
From the point of view of the impact on the atmosphere, the activities that might form atmosphere pollution sources might be divided in:
For the period of execution works, there are considered following types of sources:
Diffusing emission sources:

- The execution works of boreholes for the replacing/ extension of pipe networks, for the disaffecting and remedy of some structures. The emission sources adequate to the works of rehabilitation and extension of pipe networks are sources with limited functioning in time, the work front being changed during the development of works. Polluters; sild and powder. As a pollution source limited in time, there might be also considered the period when there shall be demolished constructions in the actual Wastewater Treatment Plant. In this period of time there might appear silt and particles in suspension.
- During the functioning of works proposed to be achieved – the activities that might form atmosphere pollution sources are those connected to the circulation and effective treatment of wastewaters.
- The polluters sources of the atmosphere specific to the functioning of the Wastewater Treatment Plant are following: mobile sources – The Wastewater Treatment Plant hasn't in its endowment vehicles, but in the precincts when it is needed, there pass vehicles. They might generate the atmosphere pollution with CO,NO_x, SO_2, unburned hydrocarbons C_mH_n. From this point of view, there might be said that the emissions of polluters are intermittent and take place along the route crossed by the vehicle in the precincts of the station. These emissions take place in the neighborhood of the soil. Order No. 462/1993, regarding road traffic, mention that polluting emissions of road vehicles are limited with preventive character by the technical conditions foreseen at the homologation of vehicles. This operation is done at the registration for the first time in the country, the respective type of vehicle. These emissions are, as well, checked periodically at the technical inspections that are done periodically during the use of the vehicle in Romania.
    - undirected stationary sources
    - due to the treatment activity of proper wastewaters that might be produced by:
        - circulation of waters in the precinct of the station;
        - Sludge disposal on the platform.

Concentrations of polluters in the emission form the process of treatment wastewaters cannot be calculated, because the sources do have no discharge sections. The estimating results is done in the most unfavorable situations.

There are not any installations for the collecting and dispersion of polluters, but they are in very small quantities and do not produce a pollution of the atmosphere.

Thus, it might be concluded that, from the point of view of the environmental factor AIR, the activity on the studied location presents no significant power source.

Although it is appreciated an insignificant impact on air quality, it is recommended to be specified a series of measures for reduction of emissions to minimize the disturbance created, such as:

Maintenance of lorries and equipments according with a repair schedule /periodical revisions.

Assurance of a correct management of waste, including the sludge generated in WWTP.

Daily clean of access roads.

Plantation with greensward of spaces without concrete / existing asphalt between the objects of WWTP for soil fixation and avoid dust.

Regarding the generated emissions by the mobile sources, these have to respect the actual legislation.

It will impose to the Contractor to use only equipments and vehicles that have technical revisions updated and are inscribe in the legal norms.

It will be imposed to the Contractor a series of protection measures against noise and vibrations in the residential areas.

Imposed measures refer to:

- Minimize and delimitation of work area
- It is forbidden auto driving outside of streaked roads for building yard function (access roads, technological roads).
- All motors of the plants and trucks shall be foreseen with noise dampers. Based on data regarding the acoustic powers of the noise sources, as well as on data presented in the specialty literature, it is estimated that in the area of the work frontal parts in the exploitation activity there are generated noise levels of at most 75 - 80 dB in their immediate vicinity.The values of the noise level are framed into the allowed limits established by STAS 10009/88. Works come from the functioning of plants and do not represent significant vibration sources, the possibility of the propagation of vibrations being reduced.

5. SOIL AND SUBSOIL

There is the risk, especially during construction period, of generating accidental losses of fuels, lubricants and other chemicals as well as of wastewaters and sludge that might contaminate the soil.

Most of resulted soil from earthworks will be used for reinstalling the initial ground level after constructions will be finished, and the rest of the soil will be transported to the landfill site or will be used as backfill material in the authorized places by the municipality.

The majority of construction works regarding pipelines position will take place along the existing roads.

It is anticipated that the excavation works on the pipelines layout and from the proposed construction placements will lead to temporally increase of soil erosion, until vegetation is reinstalled

It will be avoid direct position on the soil of construction materials. The surfaces used for materials storage , empty recipients and wastes will be impermeability previously by using plastic foils, containers, or concrete surfaces/existing asphalt.

It will be assure the functioning organization of building yard enclosures, so that activities to be limited to the design spaces, according to specific work (storage, work space, etc.)

Vegetable soil bed will be removed and disposed in separate piles and will be reinstalled after tranches are refilled, to make possible the reinstall of natural vegetation.

The Contractor will apply procedures and will assure implementation of soil protection measures against eventual accidental or structural contamination.

Repairs to the equipments and vehicles used as well as oil change will be done only in the authorized units.

5.1. WASTES

In the execution period it will result important quantities of wastes compared with exploitation period, especially during the construction works of WWTP's objectives and rehabilitation of DWTP.
The following types of wastes will be generated:

- Asphalt fracture
- Excavation land
- Sludge resulted from cleaning sewers networks
- Metallic wastes resulted from decommissioning of equipments and installations
- Waste resulted from constructions decommissioning : wood, concrete, masonry

Through the way of managing the waste, it will be achieved the risks reduction for environment and population and quantity restriction of waste eliminated from waste dump disposal

For works execution period the following measures are recommended:

The Contractor will elaborate and implement a complete waste management Plan that will comprise :

- The inventory of all types and quantities of waste that will be produced , including nuisance value ;
- Evaluation of reduction opportunity of generated solid waste , specially of types of toxic or dangerous waste ;
- Quantification of method and responsibility for measures implementation of solid waste management.
- Electromechanical equipments will be removed from the buildings and cleaned from lubricants and other contaminated substances before being delivered to authorized firms for recycling.
- Waste storage will be made in the places approved by the municipality.
- The excavation soil will be reused as backfill material

Contaminated soil will be considerate waste and will be removed
Vegetable soil bed will be removed and disposed in separate haps and will be reinstaled after the refilling of tranches (if is not contaminated).
Sludge and sand collected during cleaning operation of sewerage system , reservoirs etc, will be treated and dried before evacuation to the authorized storage landfill.
Temporary storage of materials on site will be done in a way as to reduce soil pollution risk and aquifer contamination.

During functioning

Technological wastes

Wastes generated by the activities of collecting and cleaning of waste waters and the way of their management are presented by following:

- waste resulted from cleaning channels and manholes of the sewerage network, code 200303 – it is removed manually and it is eliminated to the depony of the city;

- sludge resulted from the cleaning of waste water, code 190805

The sludge obtained at the wastewater treatment plant is proposed that on **short and average term** it is waste:

1. In the ecological deposit of non dangerous wastes
2. In agriculture – according to the Order 344/2004 for the approval of technical norms regarding the environmental protection and especially of soils when sludge from cleaning is waste in agriculture.
3. Another alternative for the final elimination of sludge would be its use at the closing of the actual waste deposits that aren't conform on the area of the Timis County.

According to the article No. 5 of the Decision No. 856/16 08 2002 wastes generated from the Wastewater treatment plant are framed in Enclosure No. 2 , as follows:

- sludge from the cleaning of waste waters COD 19 08 05;
- residuals from grits COD 19 08 01;
- sand COD 19 08 02;
- Water resulted from cleaning the channels COD 20 03 03.

6. BIODIVERSITY

Timis County has a surface of 8.697 sqkm being from the point of view of the extension, the biggest County in the country, having a preponderant plain relief -85%. It is highlighted an area of low plain, with altitudes between 80 and 100 m, with wet areas in the central Western part and North Eastern part (Plaing of Timiş and the low plain of Mureş, the Plain of Arancăi and the one of Jimbolia) and with an area of Piemont plain with altitudes of 100 – 200 m.

On the Eastern part of the County there is situated the Western part and the South Western part of the Mountains Poiana Ruscăi that are remarked by an abundance of flora and fauna species. The natural vegetation is characterized by the presence on a small scale, of plants from the forest steppe, as well as by a raised frequency of hydrophilic and hygrophilic species in the low plains and river meadows with excess moisture. The Eastern part of the County, occupied by the massif Poiana Ruscăi, is covered from the point of view of the forest vegetation with forests of common oak, forests of beech, in mixture with hornbeam and on the upper slopes of the mountain forests of spruce fir, in mixture with fir tree, sporadic meeting also samples of pine.

At the level of the Timiş County, there were stated following sites NATURA 2000:

Sites of community importance as integral part of the European Ecologic Network NATURA 2000 în Romania, Timiş County, according to the Order No. 1964 from 2007

ROSCI0064 Narrow path of the lower Mureş

Timiş County: Margina (1%)

ROSCI0108 River meadow of the lower Mureş

Timiş County: Cenad (12%), Periam (2%), Sânnicolau Mare (1%), Sânpetru Mare (9%), Saravale (3%)

ROSCI0109 Meadow of Timiş

Timiş County: Buziaş (3%), Chevereşu Mare (17%), Ciacova (5%), Foeni (2%), Ghilad (3%), Giera (1%), Giroc (11%), Giulvăz (4%), Moşniţa Nouă (13%), Pădureni (29%), Parţa (4%), Peciu Nou (1%), Racoviţa (13%), Recaş (1%), Remetea Mare (<1%), Sacoşu Turcesc (5%), Şag (9%), Topolovăţu Mare (<1%)

ROSCI0115 Marsh Satchinez

Timiş County: Biled (1%), Orţişoara (1%), Satchinez (14%), Variaş (2%)

ROSCI0250 Region of Pădureni

Timiş County: Pietroasa (5%), Tomeşti (1%)

The areas with special bird fauna protection as integral part of the ecological network Natura 2000 in Romania, Timiş County, according to GD No. 1284 from 2007.

ROSPA0047 Hunedoara Timişană

Timiş County: Orţişoara (3%)

ROSPA0069 River meadow of the lower Mureş

Timiş County: Cenad (12%), Periam (2%), Sânnicolau Mare (1%), Sânpetru Mare (9%), Saravale (3%)

ROSPA0078 Marshes Satchinez

Timiş County: Satchinez (2%)

ROSPA0079 Marshes Murani

Timiş County: Orţişoara (1%), Pişchia (1%)

ROSPA0095 Forest Macedonia

Timiş County: Banloc (<1%), Ciacova (12%), Ghilad (23%), Giulvăz (3%)

For the project “Extension and modernization of water supply and sewerage systems in Timis County-Sannicolau Mare agglomeration” are proposed measurements for reduction, improvement and conservation of NATURA 2000 site Lunca Timisului.

For Lunca Muresului Park:

- Haliaethus albicilla (codalb) who nested in the first island from upstream of the location of discharge pipeline ;
- Lutra lutra (vidra) who have feeding teritory around same location mentioned above.
- Castor fiber (beaver)(castorul) is present on the other side of river Mures;
- Fishes species Aspius aspius (Avat), Cobitis taenia (Zvârlugă), Gobio albipinnatus (Porcuşor de nisip), Gobio kessleri (Petroc), Gymnocephalus baloni (Ghiborţ de râu), Gymnocephalus schraetzer (Răspăr) Pelecus cultratus (Sabiţă), Rhodeus sericeus amarus (Boare), Sabanejewia aurata (Dunariţă), Zingel streber (Fusar), Zingel zingel (Pietrar);
- Birds species: Alcedo atthis (pesăraş albastru), Coracias garrulus (dumbrăveanca), ciocănitoarele (Dryocopus martius, Dendrocopos syriacus, Dendrocopos medius, Picus canus) etc.;
- Bombina bombina (Buhai de baltă cu burta roşie) şi Emys orbicularis (Broască ţestoasă de apă);
- Forest habitat 92A0 (forests with Salix alba şi Populus alba).

The site of WWTP's is located approximately 5 km from the site NATURA 2000, but the discharging pipelines of the WWTP's will crossed NATURA 2000 Lunca Muresului Inferior across lower on 300m up to overflow in the Mures River.

The majority of water supply system and sewerage works will be done in urban areas. On certain parts of the lay-outs it can still be necessary to remove natural vegetation.

The majority of proposed works will be developed along the roads and along the lay outs with passing approval.

The real impact on the vegetation is anticipated to be insignificant.

The noise produced by the function and circulation of equipment and trucks has an special impact on fauna, and determinates access limit in certain areas.

Predominant impact will manifest upon the soil fauna (insects) and less to the mammals and birds.

The impact to the fauna level is manifest during the works and has reversible character Stress time reduction on flora and fauna elements hard core in habitat retrieval.

Potential discharges and polluters accidental flows in surface water and sediments driving under rain water action due to soil erosion growth can produce high levels of turbidity, with negative effects on aquatic fauna.

The impact of project component on the aquatic fauna regarding the sewerage execution is reduced and by the comparison with existing situation is positive.

The necessary works for water supply and sewerage networks will be developed in inside of Sannicolau Mare locality .On this parts it is necessary to remove vegetation. The chosen solution took into consideration the fact that all construction works will be developed along the roads.

It is forbidden to perform repair works of the digging plants and the transport plants of materials in the investment area. The repair works shall be performed in specialized units.

For the reduction of the dust quantity resulted from the transport process, the beneficiary must water whenever needed, the access roads .All motors of the extraction plants and transport trucks shall be foreseen with noise dampers in order to not exceed the admitted level according to STAS 10009/1988, (65dB).

The material resulted from digging shall be deposited in places established by the beneficiary in order to be waste again at the filing of the ditches.

After finishing the investment works, the affected surface shall be arranged and leveled, in order to restore the soil to the agricultural or functional circuit, such as the landscape isn't influenced.

7. LANDSCAPE

8. BY THE PROMOTION OF THE INVESTMENT THERE IS CHANGED TEMPORARY THE LOCAL LANDSCAPE.

These changes do have a limited period, only for the period of unfurling the exploitation.

At the execution there shall be called the attention by the project – by the proposed execution technology – to totally remake all areas affected by the execution of works to the initial destination.

After finishing works and after putting into operation of the objective, the impact shall be removed and the vegetal carpet in the protection area shall be remade, that increases the aesthetic potential of the objective.

9. HUMANE SETTLEMENTS

The achievement of the investment changes and affects positively the social and economical environment by the access to qualitative water, by the discharge of cleaned wastewaters in the receiving waters, by the created working places and by the local taxes that shall reach to the local authorities. The objective shall have no negative impact on the human dwellings, the investment being achieved during the day.

The dwelling area is not affected but temporary, during daytime, by the works for the extension and rehabilitation of the water and sewerage networks.

The tip lorries and plants do have functional parameters assured by the manufacturing factories, are in good functioning conditions and their moving through populated areas is done with reduced speed, such as noise does not exceed the maximum allowable limits imposed by STAS 10009/1988.

3. MEASURES FOR THE REDUCTION OF THE IMPACT

3.1. WATER

For the reduction/elimination of water pollution risks, following measures are imposed:
Solid wastes , material resulted from excavations, fuels or oils will not be discharged into the rivers. It is recomanded selective collection of wastes for valorification/elimination by authorised firms.
The Contractor will apply procedures and prevention measures for accidental pollution.
For the objective commissioning there will be actualized the functioning exploitation and maintenance rules and prevention Plans of accidental pollutions for all components of water supply system and sewerage for Sannicolau Mare agglomeration.
AQUATIM will accept in the sewerage network only wastewater in accordance with the limits value from NTPA 002/2005.

3.2. AIR POLLUTION

Although it is appreciated an insignificant impact on air quality, it is recommended to be specified a series of measures for reduction of emissions to minimize the disturbance created, such as:
Lorries and equipments maintenance according with a periodical revisions.
Assurance of a correct waste management, including the sludge resulted in WWTP.
Access roads daily treated.
Plantation with greensward of spaces without concrete / existing asphalt between the objects of WWTP for soil fixation and avoiding dust .
Regarding the generated emissions by the mobile sources , these have to respect the actual legislation.
It will impose to the Contractor to use only equipments and vehicles that have technical revisions updated and are inscribe in the legal norms.

It will be imposed to the Contractor a series of protection measures against noise and vibrations in the residential areas.
Imposed measures refer to :
Minimize and demarcation of work area.
It is forbidden auto driving outside of streaked roads for building yard function (access roads, technological roads)

3.3. SOIL AND SUBSOIL

It will be avoid direct position on the soil of construction materials. The surfaces used for materials storage , empty recipients and wastes will be impermeability previously by using plastic foils, containers, or concrete surfaces/existing asphalt.
It will be assure the functioning organization of building yard , so that activities to be limited to the design spaces , according to specific work(storage, work space, etc.)
Vegetable soil bed will be removed and disposed in separate ahaps and will be reinstalled after tranches are refilled, to make possible the reinstall of natural vegetation.
The Contractor will apply procedures and will assure implementation of soil protection measures against eventual accidental or structural contaminations.
Repairs to the equipments and vehicles used as well as oil change will be done only in the authorized units.
The sludge resulted from DWTP and WWTP will be storage temporary on concreted platforms and sludge impact of soil **will be insignificant**.

3.4. BIODIVERSITY

Having regard to this species and habitats mentioned in the area site discharge pipeline are proposed the following measures to mitigate the impact, to remove any representative or even to improve conservation status of habitats and species,

- Execution of the works will be made outside the period of nesting the birds (march-may months);
- Execution of the works will be made outside the period increased of juveniles of beavers and otters.(breeding period may, gestation 100 days, increased period September-November)
- Location of the pipeline will be established together with the administrator area protected.
- Pipeline route in the area protected will be so particular that it need not be the cutting of vegetation woody;
- As a measure to improve the state of preservation of habitat forest 920A Community interest in this path around an area of approximately. 0.5 ha will remove the species Amorpha Fruticosa and will plant 1000 seedlings of poplar black and white, Salix and oak;

- fitting and proper means of measuring the flow of waste water discharged, the registration and flows with facilities for sampling of water for analysis in places well established and systems automated determining the quality of water treated;
- contractor will demarcate work area to prevent/minimize destruction areas plant, will carry out an inventory of trees and bushes to be slaughtered (if needed) and will develop and implement a plan for replanting.
- Groundside plant will be carefully removed and stored in piles will be separated and then after refilling, to enable restoring vegetation;
- Access and technological roads and all areas whose coating plant was damaged, will be appropriate and appear on their original landscape
- After interventions anthropogenic which may disturb the wild, will be undertaken actions by environmental restoration techniques of environmental engineering (restorations, rehabilitations), including restoring layer vegetable groundside.
- Under the plan to prevent and combat at accidental (obligation of entrepreneur), will be any protective measures against pollution of aquatic ecosystems, attention must be granted pollution with suspended solids.
- The roads will be permanent site maintained by laying and spraying water to reduce dust.
- It will avoid direct location on groundside building materials. Areas designed for storage of building materials, the emptying canisters and temporary storage of waste will be impermeable in advance, with foil or polyethylene will use existing platforms concreted or large containers of waste for construction and demolition.
- Location pipeline which will across the site NATURE 2000 will be achieved through a park location indicated by Park Administration, so as to not be necessary cutting of trees, and the works will be conducted outside the period of nesting the birds.
- The effluent of Waste Water Treatment Plant will have to comply with the law in force and not to produce pollution of ecosystems terrestrial and aquatic of emisar.de such as effluent to comply with rules imposed and quality WWTP influents on sewage will have to comply with NTPA 002/2005, i.e. waste water discharges from sewage especially by the economical agencies will have to abide by the standards in force.

After finishing the investment works, the affected surface shall be arranged and leveled, in order to restore the soil to the agricultural or functional circuit, such as the landscape is not influenced negatively.

3.5. HUMAN SETTLEMENTS

The dwelling area is not affected but temporary, during daytime, by the works for the extension and rehabilitation of the water and sewerage networks and for the new WWTP.

The tip lorries and plants do have functional parameters assured by the manufacturing factories, are in good functioning conditions and their moving through populated areas is done with reduced speed, such as noise does not exceed the admitted limits imposed by STAS 10009/1988

4. MONITORING

In the water and sewerage networks rehabilitation area, the proposed monitoring plan for the ***construction phase*** includes the following components: the air quality in the working areas, general monitoring of health, safety and environment management.

The monitoring of the environmental factors, especially regarding the potential effects of the proposed project should be made by an independent body, having the necessary capacity and specialization, and authorized for this activity.

The contract for the implementation of priority projects must provide the following documents:

- Health and safety plan;
- Environment management plan, including intervention plan in case of accidental pollution;
- Intervention plans in case of accident and risk situations.

For the ***operation phase***, a monitoring system is planned for sampling and analyzing the WWTP's effluent on daily basis, in order to ensure the adequate control and the adoption of immediate repair measures in case of deficiencies.

For the WWTP's monitoring program, the influent and effluent are sampled and analyzing at the checkpoints within 24 hours or on regular basis (4 hours).

The monitoring of the following parameters is recommended:

- Influent in the WWTP: pH, suspended solids, biochemical oxygen demand (BOD5), chemical oxygen consumption (COC), ammonium nitrates, nitrites, total phosphorus, fixed residue, extractible substances with organic solvents;
- Effluent in the WWTP: pH, suspended solids, biochemical oxygen demand (BOD5), chemical oxygen consumption (COC), ammonium nitrates, nitrites, total phosphorus, fixed residue, extractible substances with organic solvents, phenols, detergents, chlorides.

The wastewater treatment process will be monitored based on the main physical and chemical parameters, out of which the pH, the suspended solids, BOD5 and COD, and the BOD/COD report are used for the biological wastewater treatment characterization.

In order to ensure the efficient functioning of the WWTP, it will be provided with automated measurement and control installations for:

- Wastewater and sludge flow;
- Liquids levels;
- Pressure in the air pipes connected to the aeration tanks;
- Warning devices for the maximum and minimum levels;
- pH;
- Oxygen dissolved in the aeration tanks;
- NO3 in the aeration tanks.

Monitoring of the air quality in the working areas in order to check the compliance with the labor protection legislation will be realized for the following:

• NH4 and H2S in the wastewater pumping stations of the WWTP. The labor protection legislation stipulates concentrations of maximum 30 mg/m3 for NH3 and 15 mg/m3 for H2S in the working areas.

The noise made by the pumping stations will be measured at the setting into operation and then at least once a year in order to check the compliance with the stipulations of STAS 10009-88.

The information regarding the quantity and quality of the water is recorded in the DWTP as follows:

• Raw water quantities taken into the treatment plant;

• Quantities of treated water supplied to the clients through the distribution network;

• The records of the analysis bulletins regarding the quality of the raw water;

•The records of the analysis bulletins regarding the quality of the water treated in the stages of the treatment and storage process and in the distribution network;

• The records of the analysis bulletins regarding the quality of the discharged water.

Water samplings will be made at minimum every 4 hours in order to determine the parameters: temperature, dissolved oxygen, turbidity, conductivity, free chlorine, iron, nitrites, magnesium, ammonia, organic loads, silicates, phosphates etc.

5. RISK SITUATIONS

Potential industrial accidents might take place differently during the execution and exploitation periods.

Potential accidents during the execution period

They are of the type that are produced on the building sites, being generated by indiscipline and by the non-observance, by hired staff, of the rules and norms of work protection and/ or by not using the protection equipments and they are possible to appear in connection with following activities:

- The work with plants and means of transport
- The inner road circulation and the traffic on access roads
- Fire, from different causes
- Dust or gas inhalation
- Landslide from mountainsides or collapse of ditches tranşee
- falling from the height or in excavations
- crushing on falling elements
- drowning at the execution of works on the bank of the river streams.

These types of accidents do not have effects on the environment, having limitated time and space character, but they might produce losses of human lives ir invalidity. They might also have negative economic effects by materials losses and delay of works.

Another category of accidents in this period of time, might take place in connection with local population, which is not waste with traffic concentrations induced by the access roads or in the area, or through localities. They might be also affected by unfinished works or by works that

are going to be finished, that are not signaled or without elements for warning – big excavations, etc. The victims are usually more curious children and the less advised that are attracted by the novelty character of the site, and the most unfavorable period is during days when it is not worked and the control of the access to the working points is more reduced.

Potential accidents with significant impact on the environment

- Incorrect handling of the chemical substances (chlorine gas tanks) used in the drinking water disinfection process.
- Accidental wastewater discharge in the receiving water, without treatment.
- Cracking of sewerage pipes by discharging the wastewater on the soil.

Measures for the prevention of accidents

These measures must be taken by the general building contractor and by the subcontractors by observing the Romanian legislation regarding the Work protection, the guard against fire, the civil guard and protection, the Regime of wastes and others. There shall be also observed the provisions of the execution projects, of the Laws and of the norms regarding the quality in buildings.

Shortly, the measures make reference to:

• The strict control of the working staff regarding discipline on site:

• The periodical instruction, the wear of the protection equipment

For operation phase the beneficiary must have implemented a plan for prevention and against fire, and to implemented ISO 14001/2004 regarding environmental management system and Occupational Health and Safety Management System (OHSMS), designed to create a safer workplace,

6. DESCRIPTION OF THE DIFFICULTIES

At the issuing of the Report for the valuation of the environmental impact of the investment « Extension and modernization of the water distribution network, in Timis County-agglomeration Sannicolau Mare », as environmental assessor, I had a good cooperation with SC EPTISA Servicios de Ingeneria SA Madrid in consortium with WS ATKINS International LTD, general planer, that put at my disposal all data and information needed to the achievement of the present work.

7. PROGNOSIS ON THE LIFE QUALITY/LIFE STANDARD AND ON SOCIAL CONDITIONS IN THE COMMUNITIES AFFECTED BY THE IMPACT

Considering that the time when drawing up the locality Sannicolau Mare study population has access to a source of drinking water by inadequate quality, and in terms of system connecting the water supply and sewage system is not as a percentage of 100 percent, the project will have a positive impact on health and living standard of the population in the area project. The project will lead to supply safe of the population, increasing the network connections to the drinking water supplies, connecting people to the sewage network, compliance with requirements Romanian legislation and the European standards in the collection and treatment of waste water.

8. CONCLUSIONS

The investment shall have the technological endowment needed to a good unfurling of the activity, under secure conditions, the planer considering during design and at the choosing of technological plants, the recommendations of normative documents in force.

At the valuation of the impact on the environment, there was waste the Order No. 863/2002 valuation procedures on environmental factors, in relation to the legislation in force for:

- the environmental factor water GD 352/2005, that regulates the values of the indicators at the discharge in the city sewerage and directly into natural emissaries
- the environmental factor soil Ord. 756/1997, for the approval of the regulation regarding the environmental pollution
- the environmental factor air STAS 12574-87 Air in the protected areas Quality conditions and Ord. 462/1993 the technical conditions regarding the protection of the atmosphere and methodological norms regarding the determination of emissions of atmospheric polluters produced by stationary sources
- for the environmental factor biodiversity EO 57/2007 regarding the regime of protected natural areas, the conservation of natural biotopes, of wild flora and fauna

From the analysis of objectives, it is concluded that during the achievement of the investment the major impact shall be temporary on soil and on the NATURE 2000 site Lunca Muresului Inferior it shall be a potential impact if there would not be taken needed measures to the conservation and special measures for the protection of birds on the site territory.

In this direction, the beneficiary shall take following measures:

- the prevention of the pollution with petrol products, as a result of the functioning of technological plants at digging, drilling and transport.
- there shall be strictly observed the work technology for the prevention of the aquifer pollution of average depth.
- there shall be observed the provisions of the EO 57 /2007 regarding the regime of the protected natural areas, the conservation of natural biotopes, of the wild flora and fauna
- in regards of mobile pollution sources due to the vehicles entered on the perimeter, there were made recommendations for the establishing of clear traffic routes, for the management of parking places, such as to reduce the manipulation time for the proper parking. Under such circumstances, there might be achieved a reduction of the polluting from mobile sources
- For the reduction of the impact on the environment, there must be considered the monitoring of the environmental factors water, air, soil, fauna and controlled depositing of domestic waste.

In conclusion it may be pointed out that:

- Part of the investment will be done in the Nature 2000 site Mures Lower Meadow, the area with valuable biotopes in terms conservatory manner or preferred areas birds to nested.
- Transport equipment will be done on an access road to the contractor is obligated to obtain the consent of the local public.

For bird species will take the following actions:

- To identify operational perimeter of an area nesting is Timis and administration will announce REPA Mures Floodplain Natural Park Lower
- During the nesting and migration activity will diminish so as not to disturb nesting areas and migration routes or wintering areas for birds.

Environmental Assesor,

Daniela STAMA

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